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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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British Association Addresses

BEFORE the meetings of the British Association were actually over, the addresses of the President (Professor F. O. Bower) and of the thirteen sectional presidents were available in volume form at the price of 5s. They vary in length, in style, and in subject matter, but each address, in its sphere, is a contribution of value, and the complete collection makes an interesting miscellany of the views of contemporary scientists on matters to which they have given sustained attention. Professor G. T. Morgan, the President of the Chemistry Section, dealt with "A State Experiment in Chemical Research," a summary of which was published in THE CHEMICAL AGE of last week, but several others have an interest for chemical students, such as Sir Ernest Moir's "The Interdependence of Science and Engineering," Dr. F. E. Smith's "Theories of Terrestrial Magnetism," and Professor H. S. Raper's "The Synthetic Activities of the Cell." Members of the British Association and many others will be thankful to have these notable addresses so promptly and in so convenient and inexpensive a form.

In the Chemistry Section, the strictly scientific subjects were supplemented by an unusually representative discussion on the present position of the dyestuffs industry. A summary of the papers and some notes on the attitude of the contributors appear in our Monthly Dyestuffs Supplement. All that need be added here is that the symposium was noteworthy for the variety of angles from which the subject was treated, for the authority behind each of the contributions, and for the all but unanimous conclusions reached in favour of some prolongation of the Act. To the possible criticism that subjects with political implications are rather outside the province of the British Association, it may be replied in advance that the matter was discussed by scientists in the interests of a highly important branch of science and with a view to the maintenance of a strong school of organic chemistry in this country. These aspects are less prominent than others in general discussions about the Act, but in importance to science progress here they are paramount.

The public have now a considerable amount of literature to guide them to a judgment. In addition to the discussion at Bristol, we have the comprehensive report of the Dyestuffs Development Committee, followed almost immediately by a report of the Colour Users' Association, declaring in favour of the discontinuance of the Act. The conclusions in the last document were not altogether surprising, in view of the opinions expressed by prominent members, but even yet the way is not entirely closed to some kind of compromise. The chemical merchants' organisation has not issued any official statement on the subject, but the merchant attitude is generally hostile to restrictions on import operations. The most important body from which an expression of opinion may be expected is the Association of British Chemical Manufacturers, and if occasion should arise, their intervention would no doubt be weighty in facts and arguments. But the decision, after all, does not rest with any of these bodies. It is the Government that will have to decide, and it is understood that the situation is being carefully explored in co-operation with all the interests affected. In view of recent expressions from trade union leaders, the decision of the Government will have a certain general political interest. The standpoint, however, of the industry itself is not political in the ordinary sense. It is concerned with the future of British chemical science and chemical industry. The Government decision one way or the other may carry consequences of great importance, and it will be awaited with corresponding interest among the parties principally concerned.

The Taming of Phosphorus

IT has been said of Henry Irving that he was always wholly and completely the character he represented and never himself, his personality being entirely submerged and hidden in his many different and famous rôles in tragedy and comedy. Amongst the chemical elements none resembles the great actor more in this respect than phosphorus, which plays so many parts

of distinction and importance in the daily routine of the life of the world. Fiery and untamed, the natural element itself, discovered by Brand and prepared by Boyle, fumes and bursts into flame in the atmosphere; we utilise it in matches and fireworks. Subdued by the magic of the chemist in the allotropic red form it is more amenable to usage. As a constituent of wrought iron or steel its presence is severely prejudicial, as it causes brittleness in the metal when cold; hence the opportunity and need for the basic Bessemer and open-hearth process of steel making in which, by the addition of lime, the phosphorus is almost completely removed from the molten metal. When combined with oxygen in happy unity as phosphoric acid, the element is wholly tamed, and turns all its energy to the benefaction of mankind in a variety of ways.

In agriculture the uses of the phosphates as fertilisers are manifold; they are essential plant foods, and without them we should lack our daily bread. Cheese and beer also, for phosphates form the bones of the animals and of ourselves, whilst, as Harden has shown, hexose phosphates are an essential stage in alcoholic fermentation, and hence in the brewing of beer. The very lipoids of our brain and nerve fibres are phosphatides, compounds which also occur in plant seeds such as the soya bean, in yeast, and also in tubercle bacilli: they consist chemically of glycero-phosphoric acid, sugars and fatty acids.

As knowledge progresses, it is clear that the part played by phosphorus compounds in the body increases in significance. For example, the voluntary muscles of the vertebrates have been found to contain labile compounds of phosphoric acid with creatine or arginine, which are hydrolysed when the muscle is stimulated and synthesised under other conditions; such compounds are apparently an integral part of muscle activity. They are now called phosphagens. In muscle it is established that in organic combination all types of phosphoric acid are susceptible to enzyme hydrolysis, and that even inorganic meta- and hydro-phosphates are converted into ortho.

The work of Robinson has taught us that ossifying bone contains an active enzyme-phosphatase which plays a dominant rôle in bone formation by causing hydrolysis of phosphoric esters to the point when the tissue fluid deposits the inorganic phosphates it contains. We know much of the various hexose phosphoric acid compounds produced during fermentation, which not only are prime agents in the breakdown of the sugar molecule, but also very probably play a part in the cell in the transformations of one sugar into another such as are necessary to explain the production of fructose from glucose and the ultimate formation of cane sugar in the plant.

Such a catalogue of activities of our chemical actor forces the conclusion that it plays an all-important part at the very beginning of chemical change in the cell, a thought in harmony with the need for phosphorus, for phosphates in soluble available form in the soil. What is not realised is how few soils contain the optimum amount of this element for growth and ripening. A Crookes of to-day might agitate for synthetic phosphate or, in more precise terms, for soluble phosphate, cheap enough for the farmer to be able to apply it liberally to the land.

Chemical Engineering Papers

THE recent weather in New York may, perhaps, charitably excuse the writer in *Chemical and Metallurgical Engineering*, who has been treating with a truly American disregard for convention the examination papers recently circulated by the Institution of Chemical Engineers. "In such dog days as these," he says, "when the heat, the drought, and the humidity all combine to reduce us to mere splotches of profane humanity, it is somewhat staggering to read the current examination papers of the (British) Institution of Chemical Engineers and discover with what high purpose the candidate for associate membership in that organisation must be imbued. To be sure, summers in England are much more 'livable' than in semi-tropical New York, but it is none the less the subject of our perspiring gratitude that examinations of such length and difficulty are not for us."

After examining in detail the classes of tests imposed by the Institution, the writer asks with apparent surprise what leads the Institution to impose membership requirements of exactly this nature. "Many people are but poorly convinced of the efficacy of examinations, even in school, in determining the suitability of a candidate from the viewpoint either of information or of knowledge." Although he admits it would be interesting to have such a system tried out by one of the leading technical organisations in the United States to determine whether it would raise the professional standing of its membership list, he claims that the method of the American Institute of Chemical Engineers in depending upon the past performance of the candidate and the opinion of his acquaintances in chemical engineering, is more in line with what it is desired to accomplish. While it is interesting to have such an opinion from a country where chemical engineering was recognised earlier than it has been here, we trust that the authorities of our own Institution will not be unduly influenced by this light-hearted dislike of the examination desk. The Institution, we have felt, from the outset followed a sound and bold policy in making the test of admission to its membership a thoroughly searching one. In this way it has secured from the outset a high reputation for its diplomas, the growth in its membership demonstrates that even such severe tests are not impossibly high, and no evidence has been produced yet to show that a severe initial examination test is incompatible with sound and practical engineering practice in after life.

Book Received

TRANSACTIONS OF THE INSTITUTION OF CHEMICAL ENGINEERS. Volume 7, 1929. London: Institution of Chemical Engineers. Pp. 218.

THE ADVANCEMENT OF SCIENCE. Addresses delivered at the meeting of the British Association for the Advancement of Science in Bristol, Sept. 3-10, 1930. London: British Association. 5s.

The Calendar

Sep. 15–20	Iron and Steel Institute: Autumn Meeting	Czechoslovakia.
17–20	Society of Glass Technology: Second Glass Convention	Peak Buildings, Terrace Road, Buxton.
22, 23 and 24	Ceramic Society. Joint Meeting of the Refractory Materials Section and Building Materials Section. 2.30 p.m.	Building Trades Exhibition, Olympia, London.

Residual Material in the Pigment Industry

By-Products from Alumina and Sulphuric Acid Works

Residual materials from chemical works which find a use in thep igment industry, and the purposes to which they are put, are considered in the following article which is abstracted from a recent issue of "Die Metallbörse."

It is generally known that a number of manufacturing enterprises depend upon the revenue derived from the commercial treatment of residual by-products of the major production for their profits. The subject of the utilisation of residual material is a very wide one, but the discussion of the same must be limited here to those materials which have possibilities for use in the pigment industry.

The residual material, largely unused, existing in huge dumps outside works producing alumina for aluminium reduction is that from the Meyer process of extracting the alumina from bauxite.

Dried and finely ground, this residue forms a rather low-grade brown pigment material which suffers from the disadvantage of being strongly alkaline. The objection to the alkali is that it tends to saponify the oil medium of the paint, which, naturally, is detrimental; the clay usually present in this material is also undesired. If the material is calcined before use, a series of colour tones can be obtained, and the paint dries harder and more quickly. More or less successful attempts have been made to free this material from its alkaline character, either by washing or neutralising the alkali with a calculated quantity of sulphuric acid, followed by a calcination in a reverbatory furnace, but, up to the present, it has not been found possible entirely to destroy the alkalinity by these measures, which is believed to be due to colloidally fine clay. Where the bauxite residues are used indirectly to produce colour, as in additions to the clay used in brick-making, it has proved satisfactory; an addition of 10 per cent. gives the bricks a clinker-like appearance. Even white or yellow-burning clays can be used with such additions to produce red-coloured bricks, tiles, and pavement blocks.

A considerable quantity of dried and finely ground bauxite residual is used in the fishing industry where, mixed with linseed oil, it is used as a paint for the sails of fishing smacks. In this case, the colour is not the main consideration, but the clay-like properties of the material.

In a dry and comparatively coarse-ground form, bauxite residue is used as a filling material in the asphalt covering of roads; besides a content of from 50–60 per cent. Fe_2O_3, many residues contain also 6–8 per cent. TiO_2. A profitable process for the separation and recovery of this latter valuable oxide has not yet been developed.

Residue from Sulphuric Acid Manufacture

Another residual material, which is produced in even larger quantities than the bauxite residues, is the burnt pyrite used in sulphuric acid manufacture to supply the necessary oxides of sulphur.

This material as marketed, contains about 85 per cent. of ferric oxide; where it contains copper, the latter is recovered by leaching it out by suitable means, and the iron oxide is agglomerated and serves as a constituent of the charge for iron blast furnaces. However, much of this residual material contains little or no copper, and, depending on the locality of the sulphuric acid works, it cannot always be sent to blast furnaces, especially where considerable freight charges are involved. If this material is classified according to colour and finely ground, the product is the so-called Caput mortum whose dark red to purple colour makes it of low marketable value.

It is not the appearance alone which stands in the way of a larger employment of finely ground roasted pyrite residue as a paint, but the sulphur compounds which always exist in it. This causes the material to be used chiefly for cement colouring, and only in a subordinate degree as a paint material. Under the influence of the weather, in course of time the sulphur compounds of iron tend to decompose to oxide or to soluble sulphates which become washed out.

From burnt pyrite made at a sulphuric acid works in 1922 and exposed to the weather until 1930, the sulphur content was reduced from 1·5 to 0·6 per cent. In a research series on glowing residue from a Herreshoff furnace discharged into water which was being constantly renewed, the sulphur content was still 2·2 per cent. as compared with 2·7 per cent. in the dump material from the same furnace.

With such material, the possibility exists of washing out the soluble sulphates from the finely ground material, or of treating the material with soda or barium chloride. Sodium sulphate is not very easily removed by washing and, therefore, the use of barium chloride is preferred. This results in the sulphates being converted to barium sulphate, which is chemically inert to oil and lacquer, as well as lime and cement.

Paint Material

Dust from sulphuric acid pyrites roasting plants separated from the roaster gases by the electro-static method contains besides iron oxide, compounds of lead, arsenic, selenium, etc., which affect the pigment value of the material. While poorly coloured material is difficult to market as pigment, the bright red and yellow-red oxides are bought in large quantities as paint material. For some years past the crude material has been treated before grinding in different ways to improve the colour. For example, by calcining it with an addition of 2·4 per cent. sodium chloride at different temperatures, better colour tones are produced. For obtaining a bright red pigment from pyrite residuals, the finely ground material is treated with hot sulphuric (Glover) acid in a calculated quantity to convert it mainly to iron sulphate. The product is then subjected to a regulated calcination in a suitable furnace, the calcined product washed with water to dissolve out any remaining soluble sulphate, and dried. According to the temperature employed, and the rapid or slow cooling of the product and other circumstances of operating, the colour can be varied as desired over a considerable range of tones.

In the chamber method of sulphuric acid manufacture, lead sulphate accumulates from the action of the acid gases on the lead walls of the chamber. This, however, is too strongly contaminated with iron oxide to be used as a white pigment. Washed, neutralised, dried and milled, it forms a very good covering pigment which goes under the names of "metal gray," "lead gray," "rust protection pigment," etc.

It is more difficult to find a field of employment for the spent gas purification material consisting originally of hydroxides of iron.

The chemical industry obtains from this cyanogen and rhodan compounds, Paris blue and other chemicals. The residues obtained by roasting off the sulphur are somewhat sendy, and find some use for public paths in parks, for hard tennis courts, and similar purposes, not only for the colour, but also because they prevent weeds growing.

Besides the solid residual materials used in the pigment industry, a number of otherwise waste industrial solutions can be made the source of oxide paints. These are iron chloride and iron sulphate solutions from the galvanising and other metal treating works.

Cheap artificial ochres and yellow oxides can be obtained from such solutions by precipitating the iron by chalk or a milk of zinc oxide. The iron oxyhydrate thus obtained is converted into a red-toned pigment by careful calcining at not too great a temperature.

By atomising iron chloride or iron sulphate solution in a warm dry air, a very good yellow oxide pigment is obtained; if the solution is sprayed into a calcining furnace, a high percentage of especially high quality oxide is obtained.

In the present-day manufacture of zinc oxide and "zinc white" the pure metal is seldom used as the raw material. Residual zinc material, such as zinc ashes, are used instead, and "zinc white" has long been manufactured directly from zinc ores. In other cases, brass cuttings and the like are treated to obtain simultaneously copper and zinc white.

Tin oxide, cobalt oxide, chromium oxide, and similar metal compounds fall into the group of ceramic colouring materials; they thus form a distinct class, and for the greatest part they also are obtained from residual material.

Ten Years of the Dyestuffs (Import Regulation) Act.—(II)

Report of the Dyestuffs Development Committee

Below are concluding extracts from the report of the Dyestuffs Industry Development Committee on the present position of the dyestuffs manufacturing industry in Great Britain. The report was issued on September 2 (H.M. Stationery Office, 1s. 6d.), and a lengthy extract from the earlier portion appeared in our last issue.

Dyestuffs Plant

It is the general opinion of the dyestuff makers that it is now possible to obtain without difficulty in this country practically all the machinery and plant necessary for dyestuff-making purposes. British chemical plant manufacturers are able to supply the best and latest types of plant required. The latest scientific principles are embodied in the designs and the workmanship is of the highest quality. Some idea of the scope of the industry and of the diversity of articles manufactured is obtained from the fact that there are in this country upwards of 100 firms offering plant of one kind or another for the use of chemical and allied manufactures.

A certain amount of difficulty is still encountered in obtaining sound cast steel autoclaves, but the same difficulty also applies to Continental makes. As autoclaves have to withstand high working pressure, it has been found necessary to use solid forged steel autoclaves at double the cost of castings, in order to ensure safe working. In regard to copper stills and columns for solvents, the British firms manufacture a heavier and more expensive type of plant than is required for the dyestuff industry, and consequently it has been found necessary to purchase from continental suppliers who specialise in the lighter class of plant. There is, however, no inherent reason why the lighter apparatus should not be made in this country.

Although there has been a distinct improvement in the quality of the enamelled plant made in this country during the last few years, there is still a considerable difference in the prices between the British and foreign plant.

Homogeneously lead lined tanks supplied in this country have not been found satisfactory, but it is understood that satisfactory tanks will shortly be available from a British firm, who propose to manufacture them under a foreign process.

Suitable porous tiles for filters or lining tiles and fixing cement for lining vats or vessels do not appear to be obtainable here. Increasing use is, however, being made of ebonite in lining wooden, concrete and iron acid containers, also prepared rubber for lining tanks for acid resisting apparatus, and rubber lined piping, with a tendency to cheapening plant costs very considerably.

Broadly speaking, the prosperity of the chemical plant manufacturers must depend to a great extent on that of the chemical industry as a whole. Fortunately, there is an increasing tendency for British dyestuff manufacturers to keep their processes up to date and in line with modern scientific advance. This leads to replacement of obsolete or inefficient equipment, and close co-operation betwsen the dye manufacturers and the plant makers.

Prices of Dyestuffs and Intermediate Products

Investigations which were made in 1923 showed that the average price of dyestuffs before the war for all classes was about 1s. per lb. During the war the movement of prices was naturally abnormal, and this condition existed until the year 1920, when the average price reached the level of 4s. 4d. per lb. Prices from that date have continuously declined, and the average price of all dyestuffs at the end of 1928 was 1s. 6½d. per lb., or slightly over 1½ times the pre-war average price. Since that date further considerable reductions in the prices of dyestuffs have been made in this country. In considering the figures relating to the various groups, it should be borne in mind that the figures are materially affected by the introduction of new colours, and the price at which they are put on the market. Thus, if a high-priced colour in a small group is placed on the market an increase in the average price may be shown in the table, whereas in fact there have been decreases in the individual colours in the group.

Another factor to be taken into account in this average, is that the make-up of the group in 1913 and 1928 is different in that the proportion of vat colours, exclusive of indigo (a relatively high-priced group) is considerably higher at the later date. As previously stated, vat colours were not made in this country in 1913, whereas in 1928 production was 1,877,172 lb. Having regard to this, the comparison of prices is, if anything, not so great as it appears. It is worth noting that the average price of the dyestuffs imported during 1928 is approximately 4·2 shillings per lb., and this, notwithstanding the fact that, with the exception of vat dyes, the majority of the colours were being imported in 1913.

One difficulty in securing the establishment and development of the dye industry in this country by means of the protection afforded by the Dyestuffs Act has been so to administer the Act as not to place the user in an unduly disadvantageous competitive position. With this object in view arrangements were made in the year 1922, as a result of negotiations between the dye-users and dye-makers, whereby consumers agreed that they would not press for the admission under licence of supplies of foreign dyestuffs on price grounds solely, unless the price of the corresponding British product was more than three times the pre-war price, and at the same time higher than the current foreign price. This price factor arrangement still subsists, although the factor of three has been superseded from time to time by various lower factors according to the general level of prices and the factor at present in operation is 1¾.

Cost of Dyewares

Throughout the period of the Act the high cost of dyewares has been a very serious matter to the users, and it has been referred to at every annual meeting of the Colour Users' Association since 1922.

It is obvious from a perusal of the statements made by the Chairman of the Colour Users' Association at each of these meetings which reflected the position as it then was, that the colour-using industries have been subjected to the incidence of extraordinarily high prices for their wares. This was inevitable in the early stages of the protection of the industry, but there was a distinct hope that eventually the newer industry would be in a position to meet world competition, and it is gratifying to be able to report that latterly British prices for their range of colours have approximated more or less to the general level of prices ruling on the continent. It cannot be overlooked, however, that under the method of purchasing colour in this country, a proper balance is not obtained, inasmuch as the British makers are supplying the users with types of colours used in bulk quantities, whereas the foreign types, the demand for which is increasing, have to be purchased at present in smaller lots from the continent.

The Committee feel that, substantial though the contributions to new products of the British industry have been, the maximum results cannot be expected for some years to come. The Committee feel bound to point out in this connection that it was not until a year or so after the end of the war that the Universities resumed their pre-war standard of training, and the war itself of necessity diminished both in length and quality the training given in the years during and immediately following the end of the war.

If the future of the industry is to be secured, it is essential that the number of students entering the Universities for training in organic chemistry should be maintained. Any marked diminution in this respect would be detrimental not only to the dyestuffs industry itself, but to the development of the organic chemical industry as a whole in this country.

The total numbers employed as returned under the different headings are as follows :—

	Numbers employed in year.	
	1920.	1928.
Technical staff	594	378
Research staff (full time).....	120	105
Research staff (part time)	25	28
Administrative staff	1,075	740
Works staff	5,818	5,958
	7,632	7,209

The figures show that on the whole there has been very little change in the situation. As, however, there has been a very large increase in the output since 1920, there has obviously been a very substantial increase in the output per man and, therefore, improvement in the general efficiency in the industry.

It will be observed from the above figures that there were in 1928 fewer people employed on the technical staff than in 1920. This is due to the fact that during the war, and for a period after, persons with academic qualifications in chemistry were freely employed on production work without due regard to whether their qualifications were more suited to the manufacturing side or to other branches of the industry, such as the sales side, etc. As the chemical control and research work of the industry became more highly organised, some of these chemists were transferred to other branches of the trade, whilst owing to the trade depression which started in 1921 others were compelled to find other employment.

It is satisfactory to note that the various manufacturers have been able to maintain their research work on a fairly large scale, and to employ approximately the same numbers of chemists on purely research work as distinct from manufacturing problems of a technical nature.

Effects of the Dyestuffs Act

At the time the Dyestuffs Act was passed, fears were expressed in some quarters first that it would not achieve its main object, namely, to secure the establishment of a strong British dye industry, and, secondly, that its operation must inevitably be very detrimental to the colour-using industries. From the foregoing paragraphs it will be apparent that the first fear has proved to be groundless, and that on the contrary a virile and progressive dye industry has been established.

As regards the second fear, the Committee have no hesitation in stating that the close co-operation which has existed between the dye-users and the dye-manufacturers during the period of the Act, and the manner in which the Act has been administered by the Dyestuffs Advisory Licensing Committee, have together done much to mitigate the burden placed on the colour-using industries. The constitution of the Dyestuffs Advisory Licensing Committee together with the co-operation which has also existed between that Committee and the technical organisations of the colour-users and the dye-makers ensured the smooth and efficient working of the licensing system, and has proved most useful in safeguarding the interests of the user, whilst at the same time it has afforded sufficient inducement to the dye manufacturer to develop his works and increase his efficiency.

It may be affirmed unhesitatingly that under no other form of safeguarding or protection could the same result have been achieved. Apart from the fact that the Act was a barrier against foreign importation, it has provided the British dye industry with valuable information as to the varying demands for colour.

One development during the period in which the Dyestuffs Act has been in operation is the establishment of the subsidiary industry of pigment colour making. This new industry has been established without disadvantage to the consumers of the products. British lakes and pigments are now produced in a quality superior to pre-war supplies, and in most cases superior to the pre-war standard of foreign imported pigments. They are also fully equivalent to anything which can at present be obtained from foreign sources.

Several firms in the industry has entirely rebuilt or greatly enlarged their factories. With this increase in plant there has also been a corresponding increase in labour employed, so that there are as many as four times the number of people employed to-day in this particular trade as compared with the number in the year 1913.

Another subsidiary industry which has made very satisfactory progress during the period in which the Dyestuffs Act has been in operation is the manufacture of printing inks.

Users have been subjected to serious technical handicaps in obtaining their complete requirements. Despite the close co-operation between the users, the makers and the Licensing Committee, the users undoubtedly have had difficulties which may be classified under the following general terms :—(1) Interference with the ability to obtain supplies of dyestuffs of proved quality. (2) Limitation of access to developments and improvements in the world's market.

The dyer, the printer and the finisher have to meet exactly their customers' demands with something which cannot be definitely measured, inasmuch as by the use of one material as compared with another, the ultimate result which, to the men not in the trade, does not seem of much account, yet may mean in the actual sale of the finished goods the difference between losing and obtaining the order. The production of the desired effects frequently involves numerous processes, which renders it imperative for the user to make a most careful selection of suitable dyestuffs, and years of experience are necessary to determine these facts. It is true that the onus of proof as to the satisfactory nature of the British production under the regulations imposed by the Committee was placed upon the makers, but in actual practice it has been more generally imposed upon the consumer. To that extent, therefore, there has been throughout the period of the Act considerable interference with the users' ability to obtain supplies of dyestuffs of proved quality.

As regards the limitation of access of developments and improvements, there has not been sufficient elasticity in the granting of licences for new materials. In the first place, samples had to be furnished to the Licensing Committee, thus involving delay, which in the case of novelties was detrimental to the user, since the early exploitation of the market was essential to success. The export trade demands access to novelties introduced anywhere. As an instance of the serious difficulties imposed upon users under this heading, the cases of Naphthol AS, Rapid Fast and Fast Colour Salt types, where the greatest difficulties were created in obtaining licences, may be cited, though in many cases the materials were covered by letters patent held by the producers. It seems to have been the rule for applications for licences for new material to be held up until the makers had reported upon them, and in the using industries, where novelty is of the utmost importance, any impediment to the flow of newer products is a serious handicap to the development of their export business.

I.G. "Indanthrene" Campaign

The Interessen Gemeinschaft, evidently realising that competitive textile countries have protected their dye-making industries, are now pushing with extraordinary zeal the sale of "Indanthrene" fast dyes. By arrangement with the I.G. manufacturers who use a certain selected list of dyestuffs, are authorised to attach "Indanthrene" labels to their products, and by regular advertising the public is now beginning to demand goods bearing the "Indanthrene" labels, which, of course, can only be dyed with Interessen Gemeinschaft dyestuffs. Even in this country requests have been made to British dyers by merchants to affix the "Indanthrene" label. In consequence of the Dyestuffs (Import Regulation) Act, whereby users are precluded from using the complete range of dyestuffs included in the "Indanthrene" guarantee, British dyers are unable to comply with that request. There is, therefore, the serious danger that, as the trade name "Indanthrene" by extended advertising becomes still more widely known, the demands will increase, and this position can only be met by British users having full access to the range of I.G. dyestuffs included in the "Indanthrene" selection. Many British dyers and printers advertise their own marks, but they still have to face the question of an international mark used by a particular manufacturer of dyestuffs, and it must inevitably mean a loss to British trade if colour users cannot meet the world requests for "Indanthrene" dyed goods.

Nitrate of Soda Statistics

THE reported production and total exports of nitrate during the period July, 1929/May, 1930, are compared in the following table (supplied to the Anglo-South American Bank) with those for the corresponding months of the two preceding nitrate years :—

July–May.	1929–30. Metric quintals.	1928–29. Metric quintals.	1927–28. Metric quintals.
Reported production	27,907,888	30,185,968	22,952,932
Total exports	21,351,032	28,157,882	27,572,581

Of the total amount exported during the period July, 1929–May, 1930, 13,105,505 metric quintals were despatched to Europe and Egypt, while 6,886,599 metric quintals were shipped to the United States (including Hawaii), and 1,358,928 metric quintals to various other countries.

Nitrogen and the World's Food Supply

Effects of Modern Discoveries

"THE Nitrogen Industry and Our Food Supply" was the title of an address delivered by Dr. R. E. Slade (manager and director of the works of Synthetic Ammonia and Nitrates, Ltd., at Billingham) before members of the British Association at Bristol on Tuesday night.

He recalled Sir William Crookes's presidential address to the association at Bristol 32 years before, in which he apprehended a world shortage of wheat and suggested that some means of fixing nitrogen must be found so that the yield of wheat could steadily rise. Since then there had been improvement in agricultural methods, making it possible to grow wheat in dry areas, and the discovery and use of breeds of wheat which would ripen in a shorter summer, thus pushing the wheat-growing area farther north. The yield per acre, estimated at 12·7 bushels, had since risen to between 13 and 14 bushels, but this was not an important increase, and only an insignificant portion of the increased wheat supply was due to the use of nitrogen fertilisers.

Fertiliser History

For many centuries nitrogen had been used as a fertiliser in the form of farmyard manure, and certain rotations of crops which kept up the nitrogen content of the soil had been popular. But it was not until 1840, when Liebig first pointed out the true function of nitrogen, phosphorus, and potash, that fertilising became an art based on science. From 1840 the use of nitrogen in the form of Chile nitrate steadily increased, and about 1880 ammonium sulphate became available from by-product coke ovens. By 1903 the world consumption of these two fertilisers had increased to 1,975,000 tons, equivalent to 351,000 tons of nitrogen. In 1905 calcium cyanamide was manufactured on a commercial scale for use as a fertiliser, and in the same year the arc process for combining oxygen and nitrogen of the air to form nitric acid was launched unsuccessfully in Canada. Two years later, in 1907, the arc process was established in Norway, and calcium nitrate was put on the market as a fertiliser.

Thus Crookes's dream of the commercial production of nitrogenous fertilisers from the nitrogen of the air was realised in less than 10 years. But it was the Haber-Bosch process for the fixation of nitrogen which was to supersede all others and make possible the production of all the nitrogen fertilisers required for the present and as far in the future as one could see. The fixation of nitrogen in the form of ammonia was so much cheaper than by any other process that it had very largely replaced the cyanamide and other processes, and had shaken the Chile nitrate industry to its foundation.

Cheapness of Nitrogen Fertilisers

During the year 1928 the world's consumption of nitrogen in all artificial forms, including Chile nitrate, was 1,843,000 tons, of which 10 per cent. was used in industry and the remaining 1,658,000 tons as a fertiliser. The capital required to build a works to produce fertilisers to feed one person, Mr. Slade said, was only £3, and the only other alternative, as Sir Daniel Hall had pointed out, was to bring 2½ acres of new land under cultivation, the estimated cost of which was at least £25. It was therefore more economical in capital at the present time to provide for the increasing population of the world by more intensive cultivation of land now farmed than to open up new areas.

In some countries Governments were always ready to consider and finance schemes to build railways and roads to open up new country, or to carry through irrigation schemes, although the capital to be invested for a given amount of food-producing capacity was often enormous. He suggested that these countries should rather devote their attention to making full use of the land already cultivated near their consuming centres or on roads and railways. If the whole increase of population of the world—10,000,000 a year—was fed with food produced from nitrogen fertilisers it would be easy to build the works to fix this nitrogen and find the coal and power to drive them for the next 100 years. There were still large areas of the world to be brought under cultivation, so there should be no food shortage for several generations.

At present some 56,000,000 people in the world were being supported by the food from artificial fertilising. In Holland in 1928 one-third of the crops were derived from nitrogen fertilisers. In England our agricultural efficiency was high, so that we got a good deal from the land—as much and more than Holland and Belgium would without the use of nitrogen. But there appeared to be no reason why we should not use more nitrogen and obtain as much from the land as was done in Holland and Belgium. It paid to use nitrogen fertilisers at their present price.

Explosions at Chemical Works

Reports of Preliminary Inquiries

REPORTS have just been issued on the preliminary inquiries under the Boiler Explosions Acts into two explosions during the early part of this year at the works of the Yorkshire Organic Nitrogen Co., Ltd., East Street, Leeds, and the West Works of the Salt Union, Ltd., Winsford, Cheshire, respectively.

In the case of the Leeds explosion, a cast iron manhole ring carrying a manhole door on a vertical digester failed, and parts of the ring and of the door were blown some distance away, damage being done to the walls of the building. The digester was used for the reduction of leather scrap to a powder, and involved the use of steam for about 45 minutes while the mixture of leather and water was stirred by the rotation of paddles. In designing the vessel, states the report, the question of stresses set up in the materials, due to temperature differences, did not appear to have been taken into consideration. The cast iron manhole ring which failed would be, under working conditions, considerably lower in temperature than the adjacent shell of the digester, a condition due to the thickness of the casting, the cooling effect of the atmosphere and to the fact that it formed a recess in which the contents would not be subjected to the action of the steam or the paddles and would therefore remain comparatively cool. In considering extreme stresses set up in the cast iron manhole ring, which would be sufficient to cause failure, it must also be taken into account that the riveting of a cast iron flange to a curved surface can be an operation sufficient in itself to cause failure of the cast iron in way of the flange. It is also recommended that a relief valve should be fitted directly to the digester.

At the Salt Union Works the explosion was from a cast iron tee piece in the blow-down range for five Stirling boilers. It was found to have been caused through the piece becoming so much reduced in thickness owing to external and slight internal corrosion that it failed to withstand the pressure to which it was subjected when the blow-down valve on the boiler, working at a pressure of 200 lb. per sq. in., was opened to it. An additional observation by the Engineer Surveyor-in-Chief calls attention to the considerable pressure to which blow-down pipes are subjected, especially when they are long and diverge from the straight. Periodical examinations of the pipes, as careful as those of the boiler itself, are recommended.

Each report can be obtained from H.M. Stationery Office, price 6d.

Manufacturing Chemists' Failure

THE Senior Assistant Official Receiver has issued his observations concerning the compulsory winding-up of Matthews and Wilson, Ltd., manufacturing chemists, 6/8, Cole Street, Borough, London. The accounts show gross liabilities £7,405, of which £5,401 are expected to rank for dividend, against net assets £2,311. As regards shareholders, there is a total deficiency of £19,089, the issued capital being £16,000. "It is evident that during the last two or three years the company has been in financial difficulties, and the business has been carried on precariously," it is stated.

In March a debenture-holder appointed a receiver and manager, who was carrying on the business with the object of effecting a sale as a going concern, and he anticipated being able to dispose of the business in due course as a result of pending negotiations.

The company's failure was attributed to various causes, including the loss of about £1,300 sustained as a result of litigation in 1927-28; the burden of repayments of moneys advanced at a time when the company was hampered by lack of capital; restricted credit during the past few years; and general trade depression during the past 18 months.

The Senior Official Receiver remains the liquidator of the company.

The Plastics Industry in Italy

Review of Recent Progress

DETAILS of recent developments in the Italian Plastics industry are given in the course of an article in "Commerce Reports," from which the following extracts dealing with specific branches of the industry have been taken :—

Celluloid.—The manufacture of celluloid was begun in Italy in 1924. There is now one company, the Società Italiana Celluloide, producing celluloid at Castiglione Olona. The plant originally was equipped to produce 600 tons annually, but the actual output did not reach that figure until 1927. At present the annual capacity is being extended to approximately 1,000 tons. When operating at normal, about 200 workers are employed. Celluloid is produced in rods, tubes and sheets. The quality is excellent, but the output is not yet sufficient to cover domestic consumption, and imports continue, principally from Germany. At the same time, Italian celluloid is beginning to find an outlet into foreign markets.

Cellosite.—Cellosite is the trade name of a plastic material similar to cellophane, on an acetyl-cellulose base. It is manufactured in a plant (belonging to the firm of Ettore Rossi) near Milan, equipped with the most modern machinery. Cellosite is produced in the form of thin transparent sheets, clear or coloured, gilded or silvered, and is used for wrapping toilet goods, novelties, and small articles for retail trade ; for making transparent boxes, envelopes, and book covers ; and as a backing for films. It is also being used as a substitute for celluloid in various fields, owing to its great transparency and to the fact that it is non-inflammable. Cellosite is a comparatively new item for Italy and no production figures are yet available.

Production of Bakelite

Bakelite.—Bakelite is made in Italy according to the Baekeland patents by the Società Italiana Bakelite, of Milan. Until recently, true bakelite was produced in Italy in one plant at Farraina, near Savona, but now manufacture of a similar product has started at Genoa. These products are sold under such trade names as Fimielite, Superisolite and Sigaleos. They are used principally for the manufacture of noiseless bearings, insulating materials, moulded pieces, and similar equipment. In addition, there are produced in Italy bakelite resins, soluble in alcohol and in oil ; bakelite lacquers and enamels ; a bakelite imitation of amber, tortoiseshell, and mother-of-pearl ; and bakelite cement for electric bulbs. The Società Anonima Bordoni of Turin recently absorbed the Società Anonima Ivra, which produces a synthetic resin similar to bakelite under the trade name of "Ivrite." Domestic production of solid bakelite, including the so-called ivrite and xilite, rose from 34 tons in 1923 to 300 tons in 1927. The demand for this plastic is continually expanding and production may be expected to increase.

Casein Plastics.—Zoolite and galakerite are casein plastics similar to galalith. Zoolite is manufactured at Codogno, in the Province of Milan, in plants of the Società Polenghi Lombardo of Lodi, which has a capital of 25,000,000 lire, and is connected with the largest Italian manufacturers and exporters of dairy products. The machinery and equipment of the plants recently have been renovated and their capacity doubled. The specialties of the Italian zoolite industry are piano keys and transparent sheets for combs. Zoolite is produced in sheets, rods and tubes. It is also treated in sheets in imitation of tortoiseshell, marble, ebony, ivory and mother-of-pearl. The production of galakerite was begun in 1923 in a plant of the Società Italiana Galakerite, of Milan, capitalised at 1,200,000 lire. Other plastics worthy of note are proteolite, produced by the Industria Italiana della Proteolite, Milan, and globerite, which is made at Milan by the Società Industria Globerite. The latter product is produced for the manufacture of buttons.

Corozite.—An important plastic material manufactured at Gorlago (Bergamo) by the Società Anonima Prodotti Italiana Coroziet, in a modernly equipped plant which began operations in 1925. The chief uses are in the manufacture of buttons and of moulded articles for the electro-technical industries. Corozite is very tough, is not inflammable, and may be tinted in any colour. The plant in the Province of Bergamo has a productive capacity of about 6,000 gross of buttons daily. There is a considerable export trade in corozite products, particularly buttons.

The various industries manufacturing articles from plastics in Italy are older than those producing the raw materials. In 1927 there were 113 factories making combs, hairpins and similar articles, which used celluloid and other plastics. This industry employs about 2,200 workers and is subdivided among numerous small factories employing not more than 10 workers. Only six factories employ over 100 workers and seven from 50 to 100 workers. Other industries using plastic materials, particularly celluloid, are manufacturers of umbrella handles, purse clasps, brushes, toilet articles and spectacle rims.

Soil Problems in South Africa

Papers by Sir F. Keeble and Sir J. Russell

"AGRICULTURAL Problems in South Africa" was the subject of a paper read by Sir Frederick Keeble in the Agricultural Section of the British Association last week. These problems, he said, fell into two main groups, those of arable and those of grassland, and of the two the problems of grassland were potentially of greater importance. The land, or much of it, lacked lime, and little was being done to remedy it. It was encouraging therefore to report that both in Natal and in Rhodesia experiments were now being carried out which pointed to benefits from liming.

It might be that the wealth of animal diseases which Africa possessed was but another symptom of the gradually lowered vitality of living things due to the gradual decrease in the supply of essential minerals. That it was possible to transform the grassland of South Africa was rendered probable by the remarkable results which Mr. T. W. Hall's small-scale experiments with fertilisers in different parts of the country had already achieved. These experiments suggested the conclusion that a brilliant future awaited South African grassland. It was even safe to conclude that our knowledge of the proper fertiliser treatment of grassland was only just emerging from the empirical into the scientific stage, and that the investigations of the nitrogen-phosphate balance with potash in attendance would lead to the discovery that grass could be made far more productive than is at present supposed.

Mr. Bernard Shaw, who was an interested listener, was invited by the president of the section (Dr. du Toit, Director of the Veterinary Research Institute, Oonderspoort, South Africa) to say a few words. Mr. Shaw said that to ask him to intervene in a discussion of that kind in the presence of so many authorities appeared to him to be a most unpardonable frivolity. "I know nothing of agricultural chemistry. There is only one thing I know about South Africa, and that is about box office returns, and I can only say that they are often very far from satisfactory." (Laughter.)

Fertilisers and Growth

Sir John Russell, director of the Rothamsted Experimental Station, explained some complexities of the relations between the use of fertilisers, growth, and crop composition.

The first effect of a fertiliser on a plant, he said, is to increase the uptake by the plant of the particular nutrient supplied, and therefore the amount of it in the tissues of the plant. Within certain limites the uptake is proportional to the amount supplied ; beyond these it falls off. But the fertiliser may also cause increased growth, usually very little for small amounts, more in proportion for a sufficient supply, with a falling off for an excess of supply. If the soil were insufficiently supplied with any nutrient, the effect of providing enough of it is thus to increase the amount absorbed without increasing the percentage in the plant tissues, the additional growth balancing the additional uptake. If more of the nutrient is supplied, there may be no further stimulus to growth, and therefore an increase in the proportion found in the plant.

Excesses in the amount of any nutrient in the plant may cause disturbances, especially plain in the case of nitrogen. It appears that a plant carries out its activities properly only when it contains a certain ratio of nitrogen to carbon. When the range of useful ratio is exceeded, the condition may be corrected by supplying potassium, which increases the efficiency of the leaf as a producer of carbo-hydrate, and so restores the nitrogen-carbon ratio.

India's Chemical Imports

Decline in April-June Quarter

WITH the exception of aniline dyes, all chemical groups shared in the decline in the import trade of British India during the first quarter of the fiscal year, April 1 to June 30, 1930, which is the subject of a survey by H.M. Senior Trade Commissioner in India, published in the *Board of Trade Journal*. The total chemical trade fell slightly from Rs. 74¼ lakhs to just under Rs. 73 lakhs. Unfortunately, details of the countries of origin are not yet available, but the following statement shows the variations in the imports of the principal items compared with the corresponding period of 1929 :—

Description.	1930. Rs. (lakhs).	1929.
Acids	3½	2¾
Bleaching powder	1½	1½
Carbide of calcium	2½	2¾
Disinfectants	3¼	3
Potassium chlorate	2	2
Soda bicarbonate	2	2¼
Caustic soda	6	5
Sodium carbonate	19¾	19
Sodium cyanide	1	1¼
Sodium silicate	1	1
Sulphur (brimstone)	5	5¾

Coal Tar Dyes

Alizarine.—Total imports of alizarine dyes fell from 2,073,100 lb. valued at Rs. 10¾ lakhs to 1,112,886 lb. valued at Rs. 5½ lakhs. Imports from the United Kingdom dropped from 281,336 lb. (Rs. 1½ lakhs) to 160,832 lb. (Rs. ¾ lakh), but those from Germany suffered a greater reduction, from 1,552,036 lb. (Rs. 7¾ lakhs) to 844,086 lb. (Rs. 4 lakhs). The imports from " other countries " were less than Rs. 1 lakh in value.

Aniline.—There was a marked expansion in the total trade from 2,842,603 lb. valued at Rs. 33¼ lakhs to 4,503,685 lb. valued at Rs. 60¼ lakhs. It is encouraging to notice that the British share, although still small, advanced from 115,803 lb. (Rs. 2 lakhs) to 287,601 lb. (Rs. 3½ lakhs). Imports from Germany rose by over 50 per cent. from 2,047,286 lb. (Rs. 22½ lakhs) to 3,173,418 lb. (Rs. 41½ lakhs). Arrivals from the United States rose from 341,229 lb. (Rs. 3½ lakhs) to 561,625 lb. (Rs. 5¾ lakhs). Imports from Switzerland rose from Rs. 3 to Rs. 4 lakhs and those from Italy from Rs. 1½ to Rs. 3½ lakhs.

Drugs and Medicines

The imports of drugs and medicines fell from Rs. 48½ lakhs to Rs. 41½ lakhs, but it is unfortunate that details of origin are not yet available. The principal variations in the imports were as follows :—

Description.	1930. Rs. (lakhs).	1929.
Camphor	5	6¼
Proprietary and patent medicines	8¾	10¼
Quinine salts	3½	4½

The remaining items are either negligible or are grouped under the heading—" other sorts."

Paints and Colours

There was a reduction in paints and colours trade from Rs. 31 lakhs to Rs. 24¼ lakhs. The British share fell from Rs. 19½ to Rs. 16¼ lakhs, that of Germany from Rs. 2½ to Rs. 2¼ lakhs, the United States from Rs. 3 to Rs. 1½ lakhs and " other countries " from Rs. 5½ to Rs. 3¼ lakhs.

New French Synthetic Resin

THE French " La Bakelite " company, reports the U.S.A. Assistant Trade Commissioner in Paris, is manufacturing a synthetic resin made by condensing 100 parts of furfural with 100 parts of cresol in the presence of 12 parts of lime during one hour at a temperature of 110 degrees. The liquid resin thus obtained is then treated in a kneading machine at 150 deg. with 20 parts of hydrated lime. There is added a resin of the type known as phenol-methylene, and certain plasticising materials. The resin thus obtained is said to be economical and to have excellent results and chemical properties.

Analysis of Brasses

British Chemical Standard " Bronze " (Brass) " B "

THE fifth of the series of non-ferrous standard analysed samples is now ready for issue. The analysis is as follows :—

	per cent.
Copper	58·8
Zinc	33·9
Manganese	1·03
Iron	0·94
Aluminium	1·62
Tin	1·76
Lead	0·78
Nickel	1·01
Arsenic	0·03
Antimony	0·05
	99·92

The composition is reasonably typical of that of some of the best grades of manganese bronze at present manufactured, and includes all the elements likely to be found in such an alloy.

Chemists experienced in the analysis of manganese bronze are well aware of the difficulties encountered, and though this standardisation was undertaken by analysts of repute, it was no light task to come to agreement on the composition. Now that such a standard is available no doubt all chemists making analysis of manganese bronze and other brasses will be glad to make use of the sample for confirming their analyses, investigation methods, and settling disputes. An important feature of the certificate of analyses which is issued with each bottle is the outline of the methods used by the different chemists.

The standard is available to anyone at a price based on ultimately covering the cost of preparing and issuing it. The three usual sizes, 50, 100, and 500 grm. bottles are provided, together with the certificate just referred to. Further particulars may be obtained from headquarters, 3, Wilson Street, Middlesbrough.

United Indigo and Chemical Co.

MR. GEORGE HEYWOOD, chairman, presided at the annual meeting in Manchester last week of the United Indigo and Chemical Co. After speaking of the bad state of the cotton industry, Mr. Heywood said that he could not speak with any more encouragement of the woollen industry.

" The trend of wool values is downward," he remarked. " Foreign competition has increased, and orders have been lost not on account of better quality, but because our competitors were able to offer them at prices below those at which the goods could be manufactured in this country. Our American branch, which hitherto has helped us very well, shows a loss, not so much on trading account, but on account of bad debts. Trading conditions in the industries we cater for have been very bad in that country for some time, and with the serious financial crisis in the late autumn, conditions went from bad to worse."

The annual report and balance sheet were passed.

Italian Production of Nitrocellulose

ITALY'S estimated annual production of nitrocellulose is reported as approximately 2,225 metric tons. This quantity is contributed by the following prominent manufacturers: Società Anon. Dinamite Nobel, Turin, 1,000 metric tons; Società Italiana Esplosivi e Munizioni, Milan, 175 metric tons; Bombrini Parodi Delfino, Rome, 500 metric tons; Società Italiana della Celluloide, Varese, 550 metric tons. The first two firms are controlled by Montecatini, the former producing nitrocellulose for explosives and lacquers and the latter for explosives only. Bombrini Parodi Delfino manufacture the commodity for explosives only, whereas the last named producer makes nitrocellulose for the manufacture of celluloid, nitrocellulose lacquers, and other commercial purposes. It is reported that the Distillerie Italiane, of Milan, manufacturers of solvents for lacquers, are contemplating the production of nitrocellulose in their Ferrania plant.

From Week to Week

THE BUSINESS of Rainey Bros. (Glasgow), Ltd., soap and chemical manufacturers, Riverbank Chemical Works, Rutherglen. Glasgow, is to be disposed of.

OWING TO THE DEATH OF THE PROPRIETOR, Mr. William J. Riddell, the business of Wm. Riddell and Co., chemical brokers, Phoenix Works, Russell Road, Aberdeen, is to be sold.

THE PRICE OF ACETIC ACID is the subject of a communication we have received from Shawinigan, Ltd., London, who point out that the price is £37 5s. per ton delivered, instead of £37 ex-wharf, as given in our issue last week.

THE APPOINTMENT of an industrial agent with headquarters in London, for the purpose of attracting to Canada British branch factories, is announced by the Canadian National Railways. Mr. T. A. Hooker, the appointee, is now in Canada investigating industrial possibilities in all parts of the country.

SALES of the German Potash Syndicate during August improved to 98,720 tons, as compared with 93,800 tons in July and 95,270 tons in August of last year. Sales in the first eight months of this year have totalled 1,021,812 tons, as against 1,014,527 tons in the corresponding period of 1929.

CANADIAN NATURAL GAS production commercially utilised in March, 1930, totalled 3,016,480 thousand cubic feet in all Canadian fields. This represents 11 per cent. increase over March, 1929. New Brunswick and Ontario totals were practically unchanged from last year, Alberta production accounting for almost the entire increase.

THE SUMMARY of the figures in the balance sheets of German joint stock companies, issued by the Statistical Department, show that of 79 companies engaged in the chemical industry, 69 made a net profit of 147,500,000 m. in the year 1929, and 69 a net profit of 161,200,000 m. in 1928. The losses made by nine companies were about 3,600,000 m. in each year.

THE GERMAN DYE TRUST, it is reported, has acquired the processes and properties of the Mont Cenis Company, the chemical-producing concern in the Westphalian coalfield. The purchase price mentioned is in the neighbourhood of 20,000,000 marks (£1,000,000). The Trust, it is said, does not intend to exploit the patents of the company. A series of the company's subsidiary undertakings will probably be closed down.

AN INFLUENTIAL RECEPTION COMMITTEE is in charge of the autumn meeting of the Iron and Steel Institute at Prague on Monday and Tuesday next, and the Czechoslovak authorities have arranged to entertain their visitors on a most hospitable scale. In addition to the British members of the Institute, the visitors will include representatives from Austria, France, Germany, Japan, Rumania, Spain, Sweden, the United States of America, and other countries.

THE DIRECTORS of Brownlac, Ltd., in their first report, covering the period from the date of incorporation (February 22, 1929) to June 30 last, state that tests of the shellac product, which the company was formed to exploit, have been unsatisfactory, and proceedings have been taken against the inventor and the vendor. The accounts show a loss of £5,590, which has been transferred to development account. Payments of £9,705 in a suspense account are the subject of litigation between the company and the inventor. To save expense, the factory has been closed.

DR. J. M'CRAE has just retired after over 26 years as Analyst and Director of the Government Laboratories at Johannesburg. Born in Glasgow and graduating at Heidelberg, his first appointment was as Lecturer in Chemistry at the University of Cincinnati, Chicago, U.S.A. After a year he returned to England to accept the first Priestley Scholarship at the Mason College (now University), Birmingham, being awarded the Ehrhardt Chemical Research Prize. He next held for five years a lectureship at Leeds and was later given charge of the Chemistry Department at Queen Margaret College, Glasgow. In 1903 he accepted the invitation of Lord Milner to take up the appointment of Agricultural Chemist in the then Crown Colony of the Transvaal. He remained in Pretoria for two years, after which he was transfererd to Johannesburg to the post from which he has now retired.

ANIMAL GLUE PRODUCTION in the United States during the first half of 1930 amounted to 56,621,400 pounds, as compared with 53,504,700 for the first six months of 1929.

A FATAL ACCIDENT occurred at the Marsh Works of Imperial Chemical Industries at Widnes on Friday, September 5, when John Thomas Lomax, a plumber, was killed through an oxygen cylinder weighing 98 lbs. falling on his head.

A CONFERENCE will be held in the lecture theatre of the Institution of Civil Engineers on October 16, to promote discussion of the work and objects of the Steel Structures Research Committee of the Department of Scientific and Industrial Research. Among the subjects will be the feasibility of formulating a standard practice in the use of structural steel in building throughout the United Kingdom.

PRELIMINARY TRADE RETURNS for the month of August, issued by the Board of Trade, show a fairly heavy decline over those for the corresponding month of last year. Chemical imports were £1,194,669 (against £1,636,402 in August, 1929); exports were £1,515,778 (against £2,038,572), and re-exports £69,138 (against £84,393). Detailed figures of the chemical sections will be published next week.

THE BRITISH ASSOCIATION COMMITTEE last week received a deputation from Aberdeen, and accepted an invitation for the Association to meet there in 1934, the earliest year available. Next year's meetings are to be in London, those of 1932 in York, and for 1933 in Leicester. The following were elected members of the Council for the ensuing years:—Professor H. Clay, Professor W. T. Gordon, Dr. C. W. Kimmins, Dr. H. T. Tizard, and Sir Chalmers Mitchell.

RECENT WILLS include:—Mr. Frederick Stirling Newall, F.R.S., of Castle Hill, Wylam-on-Tyne, Chairman of the Washington Chemical Co., the Tyne Investment Trust, the Waste Heat and Gas Electrical Generating Stations, of Turner and Newall, Ltd., and of Newall's Insulation Co., Ltd., and director of other companies, a generous benefactor on Tyneside, £807,384; Mr. Henry Arthur Buck, of the British Metal Corporation, estate, so far as can be at present ascertained (net personalty £16,767), £16,808.

THE FIRST STEPS in the winding-up and possible re-organisation of the artificial silk industry in Scotland were taken yesterday in Glasgow, when shareholders in Scottish Artificial Silks, Ltd., a Glasgow registered company, 96 per cent. of whose capital of £230,000 is held by Scottish Amalgamated Silks, Ltd., decided that the company should go into voluntary liquidation. The extraordinary general meeting passed a resolution that the company could not, by reason of its liabilities, continue its business, and two liquidators were appointed.

"THE USE OF NON-FERROUS METALS in the Aeronautical Industry" was the subject of the ninth autumn lecture delivered before the Institute of Metals at the opening meeting at Southampton on Tuesday, by Professor D. Hanson, Professor of Metallurgy at the University of Birmingham. While it was perhaps true, he said, that the first airships and aeroplanes owed little to the use of non-ferrous metals, the present state of aerial transport was in large measure due to the development of suitable alloys and their use in aircraft construction in large quantities. More recently, improvements both in design and in materials had made possible the development of strong reliable all-metal structures, suitable both for aeroplanes and airships. The alloys used must be strong for their weight; this requirement was fulfilled by some of the alloy steels, and by the high grade aluminium and magnesium alloys, but the steels were at some disadvantage owing to their greater density, which prevented their use in many directions owing to the thin sections that would be required to take advantage of their greater strength. The non-ferrous alloys also possessed the advantages that they could readily be used as die-castings, forgings, stampings, and so on, and lent themselves more readily to methods of standardised production that were being adopted, and would become essential as popular flying extended.

Obituary

LIEUT.-COL. ROBERT LAW, F.I.C., chief chemist and refiner at the Royal Mint, Melbourne, Australia, aged 60.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

331,728. CATALYTIC AGENTS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, August 17, 1929.

A catalyst for use in the oxidation of ammonia consists of a platinum group metal coated with finely divided rhodium or with a mixture of rhodium with one or more other platinum metals. The coating may be obtained electrolytically or by applying a rhodium salt and igniting.

331,734. CARBON DISULPHIDE. Imperial Chemical Industries, Ltd., Millbank, London, and W. B. Fletcher, T. S. Wheeler, and J. McAulay, Winnington Hall, Northwich, Cheshire. Application date, August 21, 1929.

Carbon disulphide is obtained by interaction of hydrocarbons, such as methane, with sulphur vapour at temperatures above 1,100° C. at which no carbon oxysulphide is formed. The hydrocarbon gases used may be coal gas, coke oven gas, or products from hydrogenation of carbonaceous material, and they may be diluted with inert gases. According to the Provisional Specification hydrogen sulphide may replace the sulphur vapour.

331,787. SEPARATION OF OLEFINES. C. G. Harris, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, October 24, 1929.

In the use of a solid adsorbent for separating olefines from a mixture, the adsorbent is precharged with a vapour having an affinity for the adsorbent intermediate between the affinities of the olefines to be separated. Thus ethylene and propylene may be separated by means of active carbon saturated with water vapour.

331,816. DESTRUCTIVE HYDROGENATION. H. W. Strong, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, April 2, 1929.

Vapours of higher boiling-point oils, such as middle oils, are passed with hydrogen first over a contact mass consisting of iron coated with zinc, and thereafter over a porous contact mass of ferric oxide or a chemical equivalent thereof, *e.g.*, the catalyst obtained by heating ferric oxide in hydrogen at 500° C. Separate vessels may be used for the two contact masses, or they may be arranged in the same vessel either in juxtaposition or in alternate layers. Pressures of 20 atmospheres or over and temperatures of 400° C. or over are preferred. 1,000 c. metres of hydrogen are used per ton of oil treated.

331,817. DESTRUCTIVE HYDROGENATION. C. F. R. Harrison, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, April 2, 1929.

Vapours produced by destructive hydrogenation of carbonaceous materials in the liquid phase are superheated, *e.g.*, at 500—600° C., in the absence of hydrogenating catalysts and passed, together with hydrogen, over a hydrogenating catalyst at a temperature lower than that of the superheating stage, *e.g.*, at 420—450° C. The contact masses for the superheating may consist of metals of the first three groups of the periodic system, *e.g.*, aluminium or zinc or their compounds, with iron or chromium or their compounds. The catalysts for the final stage may be those usually employed, *e.g.*, iron, nickel, cobalt, molybdenum, chromium, tin, or their compounds.

331,821. CARBON. G. C. Lewis, 45, East 42nd Street, New York, U.S.A. Application date, April 4, 1929.

Carbon is produced by heating a gas containing hydrocarbons to a temperature at which the hydrocarbon constituents react chemically without production of free carbon, cooling the resultant mixture by expansion to a temperature not sufficiently low to condense out any constituent, and incompletely burning the whole of the resultant mixture. Apparatus suitable for the treatment of natural gas by the process is described and illustrated.

331,822. DYES AND DYEING. Imperial Chemical Industries, Ltd., Millbank, London, and R. Brightman, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, April 5, 1929.

Level dyeings of regenerated cellulose materials are produced by the use of the dyestuffs obtainable by coupling a tetrazotised mono- or di-sulphonic acid of 4 : 4^1-diaminodiphenylurea with 2 mols. of a sulphonic or carboxylic acid derivative of a phenol, naphthol, naphthylamine, or *N*-substituted naphthylamine, or with 1 mol. of such a component and 1 mol. of an aminonaphtholsulphonic acid or an *N*-substituted derivative thereof. The same dyestuffs are also obtainable by the action of phosgene on 2 mols. of the corresponding aminoazo compounds resulting from reduction or hydrolysis of the monoazo products *p*-nitraniline or *p*-amino-acetanilide or derivatives thereof (at least one being sulphonated) → the above components. Numerous examples are given.

331,838. LINING REACTION VESSELS. Imperial Chemical Industries, Ltd., and F. H. Bramwell, Millbank, London. Application date, January 9, 1929.

In reaction vessels for liquids in which the inner wall is protected from corrosion by a lining of rubber, etc., separation of the rubber lining is prevented by forming the vessel with a double wall, the inner wall being perforated and having the lining affixed to its inner surface, while the space between the walls is connected to a source of pressure below that within the vessel.

331,839. DYES AND DYEING. Imperial Chemical Industries, Ltd., Millbank, London, R. Brightman and W. L. B. Wellacott, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, March 5, 1929.

Disazo dyes suitable for level dyeing of regenerated cellulose materials are obtained by tetrazotising 3 : 3^1-diaminodiphenylurea, or a substitution product thereof free from hydroxy, carboxy, or sulphonic groups, and coupling with a sulphonic or carboxylic acid of a phenol or a naphthol (1 mol.) and a 1 : 8-dioxynaphthalenesulphonic acid or 2 : 8 : 6-acid or an *N*-substituted derivative of the latter (1 mol.). The same products are obtainable by reducing or hydrolysing and treating with phosgene, equimolecular proportions of the dyestuffs of the types (*a*) *m*-nitraniline or *m*-aminoacetanilide or suitable substitution products thereof → a sulphonic or carboxylic acid derivative of a phenol or naphthol and (*b*) *m*-nitraniline or *m*-amino-acetanilide or suitable substitution products thereof → a 1 : 8-dioxynaphthalenesulphonic acid or 2 : 8 : 6-acid or an *N*-substituted derivative of the latter.

331,842. DYES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 9, 1929.

Leuco compounds of vat dyes are converted into aryl ethers by heating them or the vat dyes themselves, in presence of reducing agents, *e.g.*, metals, with alkali phenolates preferably in an inert solvent or in an excess of the phenol. In examples (1) pyranthrone or 2 : 2^1-dimethyl-1 : 1^1-dianthraquinonyl is heated with excess of phenol and zinc dust or finely divided copper or iron, or with trichlorbenzene as diluent instead of the excess of phenol, to obtain a diphenyl ether, (2) pyranthrone is reduced with sodium carbonate and hydrosulphite and thereafter heated with potassium hydroxide and phenol to obtain the monophenyl ether of dihydropyranthrone, (3) flavanthrone is heated with phenol, sodium carbonate, and zinc dust, (4) diphenyl ethers of indigo, dibenzanthrone, and Bz 2 : Bz 2^1-dimethoxy dibenzanthrone are similarly obtained.

331,869. ORGANO ARSENIC AND ANTIMONY COMPOUNDS. H. J. Barber, 30, Bridgeman Road, Teddington, Middlesex, and May and Baker, Ltd., Garden Wharf, Church Road, Battersea, London. Application date, March 8, 1929.

One molecular proportion of an arsinic or stibinic acid is condensed with four molecular proportions of an organic mercapto compound. Of these four molecular proportions two serve to reduce pentavalent arsenic or antimony to the

trivalent form for condensation with the remaining two molecular proportions to form the thioarsenite or thioantimonite. The reactants may be aliphatic or aromatic and numerous examples are given.

331,880. SYNTHETIC FATS. T. P. Hilditch, 32, Beresford Road, Oxton, Birkenhead. Application date, March 11, 1929.

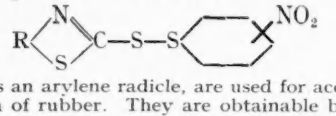
A mixture of fatty acids containing about $\frac{1}{3}$ to $\frac{2}{3}$ of saturated acids and the balance of unsaturated acids is esterified by heating with a deficiency of glycerol, if desired under reduced pressure. A suitable fatty acid mixture is obtainable by saponifying a vegetable fat or fats and, if necessary, adding animal fats or acids to adjust the proportion of saturated acids to within the desired limits. In examples, (1) a synthetic lard is made by esterifying a mixture containing palmitic, stearic, oleic, and linoleic acids in specified proportions, (2) a fat resembling natural lard is made by esterifying a mixture containing palmitic and oleic acids with or without linoleic acid, (3) a fat resembling tallow is made by esterifying a mixture of palmitic, stearic, and oleic acids, with or without linoleic acid, (4) a fat resembling tallow is made by recombining with glycerol the fatty acids from cacao butter.

331,883. DEHYDROGENATING ALCOHOLS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 11, 1929.

Aliphatic alcohols, such as ethyl alcohol, *n*-butanol, or *n*-propanol, are converted into aldehydes and hydrogen by passing their vapours over copper which has been prepared from its carbonate or other compounds by reduction at temperatures below red heat, and which is activated by addition of oxides or phosphates of metals or mixtures thereof, the catalyst being free from alkaline-reacting ingredients. The activators, *e.g.*, oxides of chromium, manganese, magnesium, or zinc, secondary sodium phosphate, tertiary barium phosphate, etc., are used in a highly dispersed condition. The temperatures used are at least 30° C. above the boiling point of the alcohol being treated.

331,885. VULCANISATION ACCELERATORS. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 11, 1929.

Mixed disulphides of the formula



in which R is an arylene radicle, are used for accelerating the vulcanisation of rubber. They are obtainable by reaction of mercapto arylene thiazoles with nitrophenyl sulphur halogenides in presence of a solvent such as benzene or toluene.

331,886. PURIFICATION OF ZINC SULPHATE SOLUTIONS. Soc. Minière et Metallurgique de Penarroya, 12, Place Vendôme, Paris. International Convention date, January 30, 1929.

Solutions of zinc sulphate containing cobalt are purified by treatment with a reagent such as dimethylglyoxime or a similar oxime or phenol which reacts with the cobalt to form a compound of high molecular weight. This compound is fixed by a suitable adsorbent such as active carbon, talc, kieselguhr, or infusorial earth, and removed by filtration or centrifuging.

331,916. DESTRUCTIVE HYDROGENATION. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 11, 1929.

Products of destructive hydrogenation leaving the reaction vessel in the gaseous form are washed and the vapours are simultaneously condensed by bringing them, while still under pressure, into contact with a washing oil, *e.g.*, high boiling-point hydrocarbon oils, destructive hydrogenation products, etc. Thus a middle oil obtained by fractional distillation of a tar from low temperature distillation of brown coal, and containing 2 per cent. of sulphur, is treated with hydrogen at 450–470° C. and 200 atm. pressure in presence of a catalyst prepared from molybdic acid and zinc oxide. The gases leaving the reaction vessel are sprayed with a washing oil boiling at 200° C., *e.g.*, an oil obtained by the same process, and the mixture is cooled in a condenser. The condensate comprises the washing oil and the condensable products of the reaction, containing in solution most of the hydrogen sulphide and gaseous hydrocarbons produced. The effluent gases, containing less than 0·3 per cent. of hydrogen sulphide, can be used for further hydrogenation.

331,922. GELATINISED ALCOHOL. H. Ohle, 64, Hasenheide, Berlin. Application date, April 12, 1929.

Sulphuric acid half esters of α- and β-diacetone fructoses in the form of their potassium salts, which may be used for the gelatinising of alcohol, are made by treating α- and β-diacetone fructoses at low temperatures with pyridine and chlorosulphonic acid without using a solvent and separating the resulting esters directly from the reaction mixtures as the potassium salts.

331,947. INTERMEDIATES FOR MEDICINAL AGENTS. K. F. Schmidt, 99, Bleichstrasse, and P. Zutavern, 95, Bleichstrasse, Ludwigshafen-on-Rhine, Germany. Application date, April 19, 1929.

Iminoethers are obtained by interaction of hydrazoic acid with carbonyl compounds in presence of catalytically effective mineral acids, phosphorus pentoxide, trichloride, or oxychloride, zinc chloride, or thionyl chloride, and of alcohols. Specified carbonyl compounds treated are cyclopentanone, acetone, and cyclohexanone.

331,952. DYES. Imperial Chemical Industries, Ltd., Millbank, London, A. Shepherdson and W. W. Tatum, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, April 22, 1929.

4-Halogeno-1-aminoanthraquinone-2-sulphonic acids are condensed with *p*-diamines in presence of copper oxide as catalyst. In an example, the sodium salt of 4-bromo-1-aminoanthraquinone-2-sulphonic acid is boiled with *p*-phenylenediamine, sodium carbonate and water, with addition of copper oxide; the product precipitated with acetic acid dyes wool level greenish blue shades.

332,057. DECOMPOSING HYDROCARBONS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 12, 1929.

In the electric arc treatment of hydrocarbons such as methane, or gases containing the same, to produce acetylene and hydrogen, the gases left after separation of the acetylene wholly or in part are divided into two parts, of which one is mixed with fresh gases and returned to the arc or arc system, and the other is further treated in a second arc or arc system, which system may or may not be the same as the first system. A flow sheet illustrating the steps of the process is given.

332,106. TREATING MERCURY SLUDGES. R. Riley and S. W. Rowell, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, August 21, 1929.

To recover mercury from the aqueous sludges obtained in processes of preparing acetaldehyde from acetylene with mercury salts as catalysts, the sludge is mixed with water and treated with chlorine at ordinary or raised temperatures, with or without increased pressure. The mercuric chloride solution is separated and the mercury is preferably precipitated as oxide which is dissolved in sulphuric acid for use again as catalyst. Any remaining mercury may be recovered from the sludge by sublimation.

332,122. NAPHTHALENE DERIVATIVES. W. W. Groves, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 10, 1929.

Naphthalene-2 : 3-dicarboxylic acid is obtained from 2 : 3-aminonaphthoic acid by diazotising, replacing the diazo group by the cyano group, and saponifying. The intermediate compounds need not be isolated. The product is purified by conversion into the anhydride.

332,147. PURIFYING GASES. S. G. Watson, 19, Surbiton Hill Park, Surbiton, Surrey, and D. M. Henshaw and W. C. Holmes and Co., Whitestone Iron Works, Huddersfield. Application date, October 15, 1929.

In the removal of sulphur from fuel gases by means of aqueous reagents, *e.g.* suspensions or solutions of metallic oxides in alkalies, the hot gases are subjected to a preliminary treatment with hygroscopic or water absorbing bodies, *e.g.* calcium chloride solution, in such a way as not to reduce the temperature of the gas below that at which the removal of the sulphur proceeds readily, *e.g.* 35°-40° C.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—309,379 (I.G. Farbenindustrie Akt.-Ges.), relating to vat dyestuffs, see Vol. XX, p. 571; 309,498 (D. Futacchi),

relating to manufacture of organic products, see Vol. XX, p. 594; 309,998 (A. Langer), relating to reduction of iron ores, see Vol. XXI, p. 7 [Metallurgical Section]; 310,549 (C. J. Hansen), relating to apparatus for decomposition of thiocyanic acid and its salts, see Vol. XX, p. 620; 312,069 (I.G. Farbenindustrie Akt.-Ges.), relating to accelerating the vulcanisation of natural or artificial varieties of rubber, see Vol. XXI, p. 90; 314,977 (Aktiebolaget Kemiska Patenter), relating to phosphoric acid and products containing phosphoric acid, see Vol. XXI, p. 224; 314,999 (Hirsch Kupfer- und-Messingwerke Akt.-Ges.), relating to method and apparatus for carrying out chemical syntheses, see Vol. XXI, p. 225; 316,945 (Compagnie Générale des Produits de Synthèse), relating to synthetic liquid fuels, see Vol. XXI, p. 337; 318,991 (R. E. Wilson and R. J. Dearborn), relating to process and apparatus for cracking oils, see Vol. XXI, p. 552; 319,762 (Rutgerswerke Akt.-Ges. and L. Kahl), relating to processes for producing pure anthracene, see Vol. XXI, p. 576.

Specifications Accepted with Date of Application

307,930. Polymerisation products of styrol, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 16, 1928.

309,865. C-alkylated phenols, Manufacture of. Schering-Kahlbaum Akt.-Ges. April 16, 1928. Addition to 254,753 and 274,439.

311,400. Azo dyestuffs, dyeing black tints, Manufacture of. I.G. Farbenindustrie Akt.-Ges. May 11, 1928.

312,345. Catalytic dehydrogenation. E. I. Du Pont de Nemours and Co. May 26, 1928.

313,124. Compounds containing active oxygen, Manufacture of. I.G. Farbenindustrie Akt.-Ges. June 7, 1928. Addition to 310,948.

314,859. Liquid products from coal or carbonaceous materials by heating under pressure in the presence of hydrogen or gases or vapours containing hydrogen, Manufacture of. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. July 3, 1928.

315,263. 2 : 3-Butylene-glycol from carbohydrates, Preparation of. T. H. Verhave, Sen. July 10, 1928.

315,264. Acetyl methyl carbinol and diacetyl, Preparation of. T. H. Verhave, Sen. July 10, 1928.

315,832. Esters, Production of. H. T. Bohme Akt.-Ges. July 19, 1928.

316,099. Vat dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. July 21, 1928.

316,143. Hydroxy-1^1 : 8^1-naphthoylene-naphthimidazoles and sulphonic acids thereof, Manufacture of. I.G. Farbenindustrie Akt.-Ges. July 23, 1928.

317,088. Saponification of cellulose acetate solutions, Process and apparatus for. Verein für Chemische Industrie Akt.-Ges. August 11, 1928.

318,907. Elastic products, Manufacture of. I.G. Farbenindustrie Akt.-Ges. September 13, 1928.

319,356. Iron carbonyl, Producing. Vereinigte Stahlwerke Akt.-Ges. September 22, 1928.

319,395. Vat dyestuffs, Manufacture of. Soc. of Chemical Industry in Basle. September 21, 1928.

333,872. Soluble polymerisation products from diolefines, Manufacture of. J. Y. Johnson (*I.G. Farbenindustrie Akt.-Ges.*) March 15, 1929.

333,882. Nitrogen-containing derivatives of the benzanthrone series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 13, 1929. Addition to 307,926.

333,894. Polymerisation products of diolefines, Manufacture of. J. Y. Johnson (*I.G. Farbenindustrie Akt.-Ges.*). May 16, 1929.

333,902. Cellulose ethers, Manufacture of. Imperial Chemical Industries, Ltd., and D. Traill. February 20, 1929.

333,904. Organic acids from oxidation products of solid paraffin and like waxes, Recovery of. J. Y. Johnson (*I.G. Farbenindustrie Akt.-Ges.*). March 14, 1929.

333,907. Separation of gas mixtures, Apparatus for. J. Y. Johnson (*I.G. Farbenindustrie Akt.-Ges.*). April 15, 1929.

333,941. Condensation products from aliphatic aldehydes and bases of the naphthalene series, Manufacture of. A. Carpmael (*I.G. Farbenindustrie Akt.-Ges.*). May 24, 1929.

333,946. Chlorine and bromine derivatives of compounds of the acetylene series, Manufacture of. A. Carpmael (*I.G. Farbenindustrie Akt.-Ges.*). May 25, 1929.

333,975. Organic compounds by dehydrogenation, Manufacture of. J. Y. Johnson (*I.G. Farbenindustrie Akt.-Ges.*). June 5, 1929.

333,989. Alkyl cyanides, Preparation of. Imperial Chemical Industries, Ltd., and T. S. Wheeler. June 14, 1929.

333,991. Acetic anhydride, Manufacture of. W. W. Groves (*E. B. Badger and Sons Co.*). June 17, 1929.

333,992. Anthraquinone intermediates and dyestuffs therefrom, Manufacture of. Imperial Chemical Industries, Ltd., and W. W. Tatum. June 18, 1929.

334,002. Rendering irradiated ergosterine stable. A. Home-Morton (*F. Hoffmann-La Roche and Co., Akt.-Ges.*). July 1, 1929.

334,009. Aldehydes, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). July 4, 1929.

334,011. Saturated lime waters, Production of. Naamlooze Vennootschap Neckar Waterreiniger Maatschappij and J. A. Heringa. July 5, 1929.

334,022. Fatty acid esters, Cleavage of. H. T. Bohme Akt.-Ges. October 17, 1928.

334,032. Hydrocarbons, Treatment of. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. October 23, 1928.

334,100. Preparation of dispersions, Process and apparatus for. H. D. Elkington. (*Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij*). October 9, 1929.

334,111. Derivatives of the naphthoylene-diaryl-imidazol series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. October 22, 1928.

334,144. Photographic reducers. I.G. Farbenindustrie Akt.-Ges. November 29, 1928.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

British Industrial Solvents, Ltd. (Deutsche Gold- und Silber Scheideanstalt vorm. Roessler). Hydrogenation of mesityl oxide. 26,464. September 4.

—— Manufacture of condensation products of aldehydes. 26,466. September 4.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of stable organic acid esters of cellulose. 26,085. September 1.

—— Manufacture of condensation products of anthraquinone series. 26,086. September 1.

—— Manufacture of nitrogenous vat dyestuffs. 26,213. September 2.

Edeleanu Ges. Treatment of hydrocarbon oils with liquid sulphur dioxide. 26,221. September 2. (Germany, February 12.)

Fenn, A. E. Production of benzine, etc., from coal, etc. 26,174. September 2.

Green, H., and Hatfield, W. H. Apparatus for use in chemical, etc., processes. 26,419. September 4.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of urea compounds. 26,177. September 2. (May 24.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of vat dyestuffs of benzanthrone series. 26,212. September 2.

—— Simultaneous production of phosphorous or phosphoric acid and alumina. 26,422. September 4. (Germany, September 4, 1929.)

—— Manufacture of aromatic arsonic acids. 26,447. September 4. (Germany, September 4, 1929.)

—— Manufacture of chlorethane sulphonic acid, etc. 26,570. September 5. (Germany, September 5, 1929.)

—— Manufacture of readily-soluble non-dyeing thio derivatives of phenols. 26,579. September 5. (Germany, September 6, 1929.)

—— Manufacture of azo dyestuffs. 26,688. September 6. (Germany, September 7, 1929.)

Imperial Chemical Industries, Ltd., and Thomson, R. F. Production of cellulose derivatives. 26,228. September 2.

—— Cellulose esters. 26,229. September 2.

—— Recovery of minerals, etc., by froth flotation. 26,288. September 3.

—— Aqueous, etc., solutions for use in cooling systems, etc. 26,548. September 5. (United States, September 7, 1929.)

Imperial Chemical Industries, Ltd., and Du Pont de Nemours and Co. Production of coated fabric material resistant to growth of fungus. 26,549. September 5.

International Agricultural Corporation and Wade, H. Making phosphoric acid and cyanamide. 26,082. September 1.

Pickard, J. A. Water-softening plant. 26,358. September 3.

Scottish Dyes, Ltd., and Thomas, J. Dyes. 26,218. September 2. (March 7, 1929.)

Soc. Chimique de la Grande-Paroisse Azote et Produits Chimiques. Manufacture of saltpetre. 26,421. September 4. (France, November 15, 1929.)

Tatum, W. W. Halogenation of anthraquinone derivatives. 26,230. September 2.

Union Chimique Belge Soc. Anon. Manufacture of ammonium phosphates. 26,521. September 5. (France, November 7, 1929.)

Walton, E. Manufacture of organic arsenic compounds. 26,265. September 3.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID, CHROMIC.—1s. 0¾d. per lb. d/d U.K.

ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—Spot £20 to £25 per ton, makers' works according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA (ANHYDROUS).—Spot, 11d. per lb., d/d in cylinders.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER, 35/37%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.

BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards).

CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d in drums.

CHROMIUM OXIDE.—9½d. and 10d. per lb. according to quantity d/d U.K.

CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 10s. per ton d/d U.K.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 7d. to 1s. 11d. per gall. pyridinised industrial, 1s. 9d. to 2s. 1d. per gall.; mineralised 2s. 8d. to 2s. 11d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity; ground ½d. per lb. extra.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

POTASSIUM CHROMATE.—8d. per lb. d/d U.K.

SALAMMONIAC.—Firsts lump, spot, £42 10s. per ton d/d station in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE, UNGROUND.—Spot, £3 7s. 6d. per ton d/d station in bulk.

SODA ASH, 58° E.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.

SODA CAUSTIC, SOLID, 76/77°E.—Spot, £14 10s. per ton, d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2 cwt. bags.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.

SODIUM BICHROMATE CRYSTALS.—3¾d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.b. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM CHROMATE.—3¼d. per lb. d/d U.K.

SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d address in bags.

SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton d/d station in drums. Crystals—Spot, £7 10s. per ton d/d station in casks.

SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6d. to 7½d. per lb. Crude 60's 1s. 6d. to 2s. per gall. August/December.

ACID CRESYLIC 99/100.—2s. 2d. to 2s. 4d. per gall. B.P., 5s. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Refined, 2s. 7d. to 2s. 10d. per gall. Pale, 95%, 1s. 9d. to 1s. 10d. per gall. 98%, 1s. 11d. to 2s. Dark, 1s. 6d. to 1s. 7d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5½d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 9d. to 1s. 11d. per gall. Pure, 1s. 11d. to 2s. 2d. per gall.

XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, for Export, 6¼d. to 6¾d. per gall. Home, 4d. per gall. d/d. Middle oil, 4¼d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 1⅜d. to 1½d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8¼d. to 8¾d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 6d. per gall. Solvent 90/190, 11d.. to 1s. 2½d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £3 to £4 per ton. Whizzed, £4 to £5 per ton. Hot pressed, £8 per ton.

NAPHTHALENE.—Crystals, £10 per ton. Purified Crystals, £14 10s. per ton. Flaked, £11 per ton.

PITCH.—Medium soft, 46s. to 47s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 6d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID GAMMA.—Spot, 3s. 9d. per lb. 100% d/d buyer's works.

ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 5d. per lb. 100% d/d buyer's works.

ACID NEVILLE AND WINTHER.—Spot, 2s. 7d. per lb. 100% d/d buyer's works.

ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8½d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8½d. per lb. d/d buyer's works.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.

BENZIDINE BASE.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.

BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.

o-CRESOL 30/31° C.—£3 1s. 10d. per cwt., in 1 ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL 34·5° C.—1s. 9½d. per lb., in ton lots.

DICHLORANILINE.—1s. 10d. per lb. f.o.r. works.

DIMETHYLANILINE.—Spot, 1s. 8d. per lb., drums extra d/d buyer's works.

DINITROBENZENE.—8d. per lb.

DINITROCHLORBENZENE.—£74 per ton d/d.

DINITROTOLUENE.—48/50° C., 7½d. per lb.; 66/68° C., 9d. per lb. f.o.r. works.

DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

a-NAPHTHOL.—Spot, 1s. 11d. per lb. d/d buyer's works.

B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.

a-NAPHTHYLAMINE.—Spot, 1s. per lb. d/d buyer's works.

B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½d. per lb, 5-cwt. lots, drums extra, d/d buyer's works.

NITRONAPHTHALENE.—9d. per lb.

R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.

SODIUM NAPHTHIONATE.—Spot, 1s. 6½d. per lb. 100% d/d buyer's works.

o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 9d. per lb. d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 1d. per lb. ex works.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

WOOD CREOSOTE.—1s. 9d. per gall., unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 2d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 8d. to 1s. 10d. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—4s. 10½d. to 5s. 3d. per lb.

CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.

CARBON BLACK.—3½d. to 4 1/16d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 9d. per lb.
LITHOPONE, 30%.—£20 to £22 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 5s. per ton, delivered, barrels free.
ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.
ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., for synthetic product, according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 6d. to 1s. 6½d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 0½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb.
BISMUTH CARBONATE.—6s. 6d. per lb.
BISMUTH CITRATE.—6s. 9d. per lb.
BISMUTH SALICYLATE.—6s. 7d. per lb.
BISMUTH SUBNITRATE.—5s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 4s. 4d. per lb.
BISMUTH OXIDE.—8s. 6d. per lb.
BISMUTH SUBCHLORIDE.—8s. per lb.
BISMUTH SUBGALLATE.—6s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; For one ton lots and upwards. Packed in 1 cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 5½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 8d. per lb. Prices for 1 cwt. lots.
CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., in 1 cwt. lots.
CAMPHOR.—Refined flowers, 3s. to 3s. 2d. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—1s. to 1s. 1d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 5d. per lb. for 28 lb. lots. Green, 3s. 1d. per lb., list price. U.S.P., 3s. 3d. per lb. list price.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8½d. to 8¾d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 15s. 6d. per lb. net; Synthetic, 9s. 6d. to 11s. per lb.; Synthetic detached crystals, 9s. 6d. to 11s. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d to 7s. 11d per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb
METHYL SULPHONAL.—18s. 6d. to 20s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENAZONE.—5s. 6d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—90s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 3d. per lb. in 28 lb. lots. Smaller quantities 1d. per lb. more.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125 lb. kegs.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1 cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—43s. 6d. per lb.
SODIUM BENZOATE B.P.—1s. 9d. per lb. for 1-cwt. lots.
SODIUM CITRATE, B.P.C., 1911, AND U.S.P. VIII.—1s. 11d. per lb., B.P.C. 1923, and U.S.P. IX—2s. 3d. per lb. Prices for 28 lb. lots. Smaller quantities 1d. per lb. more.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—9s. 6d. to 10s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 8s. 3½d. to 9s. 2d. per lb., according to quantity. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—12s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—10s. per lb.
AMYL SALICYLATE.—2s. 6d. per lb.
ANETHOL (M.P. 21/22° C.).—7s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—13s. 3d. per lb.
COUMARIN.—11s. per lb.
CITRONELLOL.—8s. per lb.
CITRAL.—8s. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—9s. 3d. per lb.
GERANIOL (PALMAROSA).—17s. per lb.
GERANIOL.—7s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. per lb.
ISO EUGENOL.—11s. 6d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—9s. per lb.
RHODINOL.—46s. per lb.
SAFROL.—2s. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—13s. to 15s. per lb. Ex Guaiacol.—12s. to 13s. 9d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. per lb.
ANISE OIL.—No supplies available on spot.
BERGAMOT OIL.—10s. per lb.
BOURBON GERANIUM OIL.—21s. per lb.
CAMPHOR.—Brown, 1s. 9d. per lb.
CANANGA.—Java, 9s. per lb.
CASSIA OIL, 80/85%.—4s. 6d. per lb.
CINNAMON OIL LEAF.—6s. 9d. per oz.
CITRONELLA OIL.—Java, 2s. 5d. per lb., pure, Ceylon, 2s. 3d. per lb., c.i.f. U.K. port.
LAVENDER OIL.—Mont Blanc, 38/40%, 10s. 6d. per lb.
PEPPERMINT OIL.—English, 55s. per lb.; Wayne Cty., 12s. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, September 11, 1930.

BUSINESS during the current week has been rather slow and prices remain steady. Export business has been a little better.

General Chemicals

ACETONE.—Remains firm at £71 10s. to £80 per ton according to quantity, and in steady request.

ACID ACETIC.—Unchanged and firm at £36 5s. to £38 5s. for technical 80% and £37 5s. to £39 5s. per ton for pure 80%, according to quantity, delivered to buyers' works.

ACID CITRIC.—About 1s. 6½d. per lb., less 5%. Still rather quiet.

ACID LACTIC.—Steady at £41 to £42 per ton for the 50% by weight pale quality, and in regular request.

ACID OXALIC.—Firm at £30 7s. 6d. to £32 per ton according to quantity.

ACID TARTARIC.—Still rather quiet at 1s. 0¼d. per lb., less 5%.

ALUMINA SULPHATE.—In steady demand at £8 to £8 15s. per ton for the 17/18% iron free quality.

ARSENIC.—Remains firm at about £16 per ton, free on rails, at mines, and the improved demand continues.

CREAM OF TARTAR.—Still quiet at about 87s. 6d. per cwt., ex warehouse London.

COPPER SULPHATE.—£21 to £22 per ton, free on rails London, with a fair demand.

FOMALDEHYDE.—Steady at £32 per ton, ex wharf London, for the 40% volume.

LEAD ACETATE.—Unchanged and firm at £40 per ton for white and £39 per ton for brown.

LEAD NITRATE.—In steady request at £29 10s. to £30 per ton.

LITHOPONE.—£19 15s. to £23 per ton, according to grade and in regular request.

CARBONATE OF POTASH.—£28 to £29 per ton for the 96/98%, arsenic free quality.

PERMANGANATE OF POTASH.—Firm at 5½d. per lb., for B.P. needle crystals and in steady demand.

PRUSSIATE OF POTASH.—In quite active demand and firm at £63 10s. to £65 10s. per ton, according to quantity.

BICHROMATE OF SODA.—Steady request at 3¾d. per lb., with discounts for contracts.

SODIUM HYPO SULPHITE.—Photographic crystals in steady request at £14 15s. per ton, commercial £8 10s. per ton.

SULPHIDE OF SODIUM.—£10 5s. to £11 5s. per ton for solid and £11 5s. to £12 5s. per ton for broken, according to quantity, carriage paid.

TARTAR EMETIC.—In a little better demand at about 11d. per lb.

ZINC SULPHATE.—Unchanged at £12 10s. per ton, with a little better demand.

Coal Tar Products

There is nothing fresh to report in the coal tar products market, prices being unchanged from last week, with very little inquiry.

MOTOR BENZOL.—Remains at about 1s. 5½d. to 1s. 6½d. per gallon f.o.r.

SOLVENT NAPHTHA.—Unchanged at about 1s. 2½d. to 1s. 3d. per gallon.

HEAVY NAPHTHA.—Quoted at about 1s. 1d. per gallon f.o.r.

CREOSOTE OIL.—Unaltered, at 3d. to 3¼d. per gallon f.o.r. in the north, and at 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Remains at 2s. per gallon for the 98/100% quality, the dark quality 95/97% being quoted at 1s. 10d. per gallon.

NAPHTHALENES.—The firelighter grade is offered at £3 10s. to £3 15s. per ton, the 74/76 quality at about £4 to £4 5s. per ton, and the 76/78 quality at about £5 per ton.

PITCH.—Remains at a nominal figure of 37s. 6d. to 42s. 6d. per ton f.o.b. East Coast port.

Prices for ordinary pale 98/100% cresylic acid remain at 1s. 10d. to 2s., better grades being quoted at 2s. 5d. to 2s. 7d., according to quantity and specification. American duty free 97/99% quality is quoted at 1s. 7d. to 1s. 8d., and dark 95% 1s. 6d. to 1s. 7½d. per gal.—in both cases naked at works.

Nitrogen Fertilisers

Sulphate of Ammonia.—Export.—During the week sales have been reported at £7/£7 5s. per ton f.o.b. U.K. port in single bags for prompt shipment. The market, however, presents a firmer appearance and higher prices are quoted for forward deliveries. *Home.*—The home price for September remains at £8 19s. per ton with October delivery quoted at 2s. per ton higher. At present there is very little interest in the home market.

Nitrate of Soda.—Some of the large brokers have commenced to purchase at the new price scale in operation or various markets. Prices show only a very small reduction on those in operation last year. In view of the lower prices operating for certain other forms of nitrogen, it seems doubtful if the optimism current in nitrate circles is justified.

Scottish Coal Tar Products

THERE has been a slight revival of buying during the week but not in sufficient quantities to make any material alteration in market conditions. Pitch inquiries are not yet forthcoming, but stocks in this area are not too high.

Cresylic Acid.—Trading is on a small scale and prices are unaltered. Pale, 99/100%, 1s. 9½d. to 1s. 10½d. per gallon; pale, 97/99%, 1s. 8½d. to 1s. 9½d. per gallon; dark, 97/99%, 1s. 7½d. to 1s. 8½d. per gallon; high boiling, 1s. 9d. to 1s. 11d. per gallon; all ex works in bulk.

Carbolic Sixties.—Owing to the lack of business, producers are not making at present. Value is nominal at 2s. to 2s. 2d. per gallon.

Creosote Oil.—There is a steady demand from home buyers for virgin oils, but shipment orders are scarce. Specification oil, 2¾d. to 3¼d. per gallon; gas works ordinary, 3d. to 3¼d. per gallon; washed oil, 3d. to 3½d. per gallon; f.o.r. in buyers' tanks.

Coal Tar Pitch.—Inquiries are slow and quotations remain nominal at 45s. to 47s. 6d. per ton f.a.s. Glasgow. Home value is about 47s. 6d. per ton f.o.r.

Blast Furnace Pitch.—Unaltered, controlled prices being 30s. per ton, f.o.r. works for home trade, and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—Deliveries are gradually falling away and value is easy at 3d. to 3¼d. per gallon f.o.r. works naked.

Blast Furnace Tar.—Remains quiet at 2¾d. per gallon f.o.r.

Crude Naphtha.—Purchases are taking place at 4d. to 4¼d. per gallon f.o.r. in bulk quantities.

Water White Products.—Motor benzole continues to be taken up in substantial quantities at 1s. 5½d. to 1s. 6d. per gallon and naphthas are steady at 1s. 2½d. to 1s. 3½d. per gallon for 90/160 grade and 1s. to 1s. 1d. per gallon for 90/190 grade, all ex makers' works.

South Wales By-Products

THERE is very little change to report in South Wales by-product activities. The call for pitch remains slow, stocks being well in excess of demand. Prices are unchanged round about 47s. per ton f.o.b. Refined tars have a steady, if moderate, call, with quotations for coke oven and gasworks tar unchanged. Road tar has a small, steady call at about 12s. 6d. to 13s. 6d. per 40-gallon barrel. Naphthas are unchanged, solvent having a fair call round about 1s. 3¼d. per gallon, while heavy has scarcely any demand at from 11d. to 1s. 1d. per gallon. Creosote remains weak at 3¾d., but motor benzol is a bright feature round about 1s. 4½d. per gallon. Patent fuel and coke exports continue to be on the slow side. Patent fuel prices, for export, are as follows:— 21s. 6d. to 22s. per ton, ex-ship Cardiff; 20s., ex-ship Newport; 20s. to 21s. ex-ship Swansea. Coke prices are:—Best foundry, 35s. to 37s.; good foundry, 27s. 6d. to 32s. 6d.; furnace, 21s. to 21s. 6d.

Latest Oil Prices

LONDON, September 10.—LINSEED OIL closed quieter at a net decline of 5s. to 7s. 6d. per ton. Spot, ex mill, £33 10s.; September, £30 15s.; October-December, £29 7s. 6d.; January-April, £28 2s. 6d. naked. RAPE OIL was dull and 20s. per ton lower. Crude extracted, £33; technical refined, £34 10s., naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £26 10s.; refined common edible, £32; deodorised, £34, naked, ex mill. TURPENTINE was quiet. American, spot, 36s. 9d.; October-December, £37 8s.; January-April, 38s. 9d. per cwt.

HULL.—LINSEED OIL, naked, closed for spot at £33; September, £32; October-December, £30 10s.; January-April, £29 5s. COTTON OIL, naked, Egyptian crude, spot, £26 5s.; edible refined, £29 15s.; technical, spot, £29 10s.; deodorised, spot, £31 15s. PALM KENNEL OIL.—Crude, naked, 5½ per cent., spot, £26. GROUNDNUT OIL.—Crushed extracted, spot, £36 10s.; deodorised, spot, £34 10s. SOYA OIL.—Extracted and crushed, spot, £27 10s. deodorised, spot, £31. RAPE OIL.—Crushed extracted, spot, £34; refined, spot, £36. TURPENTINE, CASTOR OIL and COD OIL unaltered. Net cash terms ex mill.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, September 9, 1930.

A SLIGHT improvement is recorded in the Scottish heavy chemical market, home inquiries being generally active. Prices have now reached rock bottom, and changes, if any, will be definitely in an upward direction.

Industrial Chemicals

ACETONE B.G.S.—£71 10s. to £80 per ton, ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—Prices ruling are as follows:—Glacial 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical 80%, £36 5s. delivered in minimum 1 ton lots.

ACID BORIC.—Granulated, commercial, £22 per ton; crystals, £23; B.P. crystals, £31 per ton; powder, £32 per ton, in 1 cwt. bags delivered free, Great Britain, in 1 ton lots and upwards.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID NITRIC 80° quality.—£23 per ton, ex station, full truck loads.

ACID OXALIC 98/100%.—On offer at the same price, viz., 3¼d. per lb., ex store. Offered from the Continent at 3¼d. per lb., ex wharf.

ACID SULPHURIC.—£3 2s. 6d. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC B.P. CRYSTALS.—Quoted 1s. 1d. per lb., less 5% ex wharf. On offer for prompt delivery from the Continent at 1s. 2½d. per lb., less 5% ex wharf.

ALUMINA SULPHATE.—Quoted at round about £8 15s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10¼d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton; powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID 80°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £30 per ton, ex wharf. On offer for shipment from China at about £27 10s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £18 per ton, ex wharf, prompt shipment from mines. Spot material still on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £11 per ton, c.i.f. U.K. ports. For Continental material our price would be £10 per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. per ton to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 15s. per ton, c.i.f. U.K. ports.

COPPERAS GREEN.—At about £3 15s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE 40%.—Now quoted £33 per ton, ex store. Continental material on offer at about £32 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £33 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £46 per ton, c.i.f. U.K. ports.

LEAD, ACETATE.—White crystals quoted round about £39 to £40 per ton, ex wharf. Brown on offer at about £2 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality, 64 O.P., quoted 1s. 8d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4½d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer at £26 10s. per ton, ex store, offered from the Continent at £25 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100%—POWDER, Quoted £26 5s. per ton, ex store; crystals, 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s.6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb., ex wharf.

SODA, CAUSTIC.—Powdered 98/99%, £17 10s. per ton, in drums, £18 15s. per ton in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums, all carriage paid buyers' station. Minimum 4-ton lots. For contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3⅞d. per lb. delivered buyers' premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 13s. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £10 2s. per ton, carriage paid buyers' sidings, minimum 6-ton lots, but demand in the meantime is small.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Prices 55s. per ton, ex works, 57s. 6d. per ton delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 broken per ton, 60/62%, £11 per ton. Crystals 30/32%, £8 2s. 6d. per ton, all delivered buyers' works on contract minimum 4-ton lots. Special prices for some consumers. Spot material, 5s. per ton extra. Crystals, 2s. 6d. per ton extra.

SULPHUR.—Flowers, £12 per ton; Roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £20 per ton f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £12 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Seized German Chemical Patents

ROYALTIES cases arising from the seizure of German chemical patents during the war are to be considered by the Supreme Court of the United States during the October term. They are at present the subject of conflicting decisions in the lower Courts. The former German owners have applied for a writ of *Certiorari* to the Circuit Court of Appeals. The patents involved have been administered by the Federal Trade Commission, licensed to E. I. du Pont, and about a year later sold to the Chemical Foundation, Inc., by the Alien Property Custodian. The former owners have sued to recover royalties before the acquisition by the Alien Property Custodian, and the Chemical Foundation for royalties after, out of the fund held by the treasurer of the United States. The lower Courts held that the former owners were not entitled to royalties, but all were due to the Chemical Foundation. The German owners claim that this decision is contrary to all patent law and practice. The Foundation contends that the custodian seized the former owners' rights. The Government wants all decisions uniform for a proper disbursement of the fund.

Tung Oil Exports

A CABLE dated July 5, dispatched by the U.S.A. Consul at Hankow, states that the total exports of tung oil from Hankow during June aggregated 17,778,000 lb., of which 14,742,000 lb. went to the United States and 3,036,000 lb. to Europe. Stocks on hand at Hankow at the end of June were calculated at approximately 3,900 short tons. The total exports of oil from Hankow during June were low, but the share of the United States was far in excess of the quantity received during the corresponding month of last year.

Company News

BEDE METAL AND CHEMICAL CO.—An interim dividend of 6¼ per cent., less tax, has been declared.

TAYLORS (CASH CHEMISTS) TRUST, LTD.—An interim dividend of 5 per cent., less tax, on the deferred shares has been declared by the directors in respect of the year to March 31, 1931.

AMALGAMATED ZINC (DE BAVAY'S).—A dividend at the rate of 8 per cent. per annum is announced for the six months ended June 30 last, payable on October 10 to shareholders registered on September 19.

BEDE METAL CO.—It is announced that an interim dividend of 6d. per share, less income tax, will be paid on the issued share capital in respect of the operations of the company for the six months ended June 30 last.

COOPER, MCDOUGALL AND ROBERTSON, LTD.—The directors announce that, in view of the world-wide disturbance of trade, and the effect thereof on foreign exchanges, after making due provision for reserves, they are pursuing their conservative policy by declaring an interim dividend of 3 per cent. actual (less tax), payable September 30. The usual half-yearly dividend on the 7 per cent. cumulative preference shares will also be paid on that date Last year an interim of 7 per cent. was paid on the ordinary shares, followed by a final of 8 per cent., making 15 per cent. for the year, as in the preceding period.

Potash Salts in Canada

Investigations in Maritime Provinces

THE Mines Branch of the Canadian Department of Mines has just issued Report No. 710, containing, *inter alia*, data prepared by Mr. L. H. Cole, relative to potash salts identified in the Maritime Provinces. Although commercial deposits of potash salts have not been discovered in Canada, promising indications have been encountered in a number of spots, particularly in the Maritime Provinces. At Malagash, Nova Scotia, a deposit of rock salt was discovered in 1917, and an analysis of the brine showed 0·55 grammes of potassium per litre. Since that time a number of analyses of the rock salt have shown from 0·14 to 0·20 per cent. of potassium. Potassium chloride also occurs in this locality in small lenticular concentrations in the form of crystalline masses of pink and yellowish green sylvite in a matrix of halite, resembling some of the German occurrences.

The extent of these potash-bearing lenses is at present unknown, as the operations now in progress are aimed at the recovery of salt (sodium chloride) only. It is thought likely, however, that it may be commercially feasible to recover potash salts as a by-product from the evaporating pan. In the province of New Brunswick, about eight miles to the south-east of Moncton, a well drilled by the D'Arcy Exploration Co. in a search for natural gas and petroleum entered beds of rock salt having a thickness of about 485 ft. and containing small quantities of potassium. Further drilling and sampling is necessary in order to determine whether potash salts are present in commercial quantities.

Nitrogenous Fertiliser Imports in Czechoslovakia

IMPORTS of nitrogenous fertilisers into Czechoslovakia in 1929, amounting to 119,000 metric tons, were 42 per cent. higher than in 1925. This gain was principally due to the larger receipts of sodium nitrate, which grew from 62,000 metric tons in 1925 to 95,000 tons in 1929. The following figures show the imports of nitrogenous fertilisers into Czechoslovakia from 1925 to 1929 inclusive; 84,436 tons in 1925; 65,965 in 1926; 70,316 in 1927; 74,334 in 1928; and 118,686 in 1929. Although the Czechoslovakian nitrogen industry has developed rapidly in the last few years, imports of nitrogenous fertilisers continue to advance. Germany supplied 11,404 tons of calcium nitrate. The development of production of ammonium sulphate, however, is reflected in the declining imports, which dropped to 1,135 tons as compared with the export figure of 3,346 tons.

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the registration of the following trade marks can be lodged up to October 10, 1930:—

IMEROL.

514,648. Class 4. Raw or partly prepared vegetable, animal and mineral substances used in manufactures, not included in other classes. Chemical Works formerly Sandoz; also trading as Chemische Fabrik Vormals Sandoz and as Fabriques de Produits Chimiques ci-devant Sandoz (a company duly incorporated under the laws of Switzerland), 60, Fabrikstrasse, Basle, Switzerland; manufacturers. July 17, 1930.

RESOLIN.

514,652. Class 4. Raw or partly prepared vegetable, animal and mineral substances used in manufactures, not included in other classes. Chemical works formerly Sandoz; also trading as Chemische Fabrik Vormals Sandoz and as Fabriques de Produits Chimiques ci-devant Sandoz (a company duly incorporated under the laws of Switzerland), 60, Fabrikstrasse, Basle, Switzerland; manufacturers. July 17, 1930.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal" have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

BRITISH INDIA.—The Director-General, India Store Department, Belvedere Road, Lambeth, London, invites tenders for 70 tons of caustic soda (sample required with tender).

CANADA.—A Toronto firm of jam makers desires to be put into touch with manufacturers of vacuum evaporators. (Ref. No. A.X. 10,146.)

NEW ZEALAND.—The Government Railways Department is calling for tenders to be presented in Wellington by November 6 for the supply of an air compressor. (Ref. No. A.X. 10,173.)

Tariff Changes

PALESTINE.—Nitrate of silver in crystals and celluloid in sheets have been added to the list of goods allowed duty free admission.

FRANCE.—The prohibition has been removed from the importation and exportation of industrial alcohol, crude and rectified methyl alcohol, acetone, nicotine and nicotine salts, superphosphates of lime, nitrates of soda and of lime, calcium cyanamide and chemical fertilisers.

ITALY.—Temporary facilities, already granted provisionally, have been extended for the importation of crude celluloid, explosives with nitro-cellulose basis and certain artificial silk yarns.

Citric Acid Exports from Sicily

SICILIAN exports of citric acid during 1929 aggregated 2,615,273 kilos, valued at 42,785,865 lire, compared with 3,156,695 kilos, valued at 49,797,023 lire for 1928. The following table shows the amount, destination, and value of shipments in 1929 of Sicilian citric acid to the principal markets:

Destination.	Kilos.	Value in Lire.
France	433,535	7,128,780
Germany	570,225	6,119,627
Great Britain	594,405	9,649,041
Argentina	215,200	3,605,520

Use of Oil as Insecticide

Problems Awaiting Research

THE use of oil as an insecticide and fungicide by fruit growers and horticulturists is the subject of a report to the American Chemical Society by Dr. E. R. de Ong, of San Francisco. He refers to the greater efficiency of oil sprays, their wide employment—it is estimated that over five million gallons is being used among fruit crops on the Pacific Coast of the United States this year—and also to a number of problems related to the subject about which practically nothing is known.

"Certain petroleum fractions have been experimented with as insecticides for sixty years, but with little growth in the practice or any degree of permanency being attained," the report says. "Now, with the establishment of the use of light refined petroleum oils, consisting principally of saturated hydrocarbons, an enormous and increasing consumption occurs, this growth being due to an increase in efficiency of control rather than to the general displacement of other types of insecticides.

"Organic forms of sulphur, combined with petroleum oils in cyclic series, have been found very effective as insecticides and also as fungicides. Experiments during the last two years have shown that such preparations can be used readily on trees in foliage as well as those in the dormant stage. The rate of volatilisation of oil has a direct bearing both on insecticidal value and plant tolerance. Lubricating oils are superior to kerosenes as insecticides, principally because they are less volatile and sufficiently viscous to resist being readily displaced. In the control of red spider, kerosene has been found to kill a low percentage of eggs and to disappear from the foliage so quickly that satisfactory control is not attained. Similar results have been noted with the more resistant scale insects. Under the same circumstances, lubricating oils of viscosities from 70 to 100 and rather high volatility have given good control. As toxicity to the insect increases with a higher volatility, however, the danger to the plant also increases, from which it will be seen that volatility determinations are a necessity for understanding the action of oil.

Laboratory Standards Needed

"Substitution, for specific needs, of oil sprays for lime-sulphur solutions has occurred, largely in the interest of increased efficiency. The use of oil in combination with lead arsenate, and frequently including nicotine, as a control for codling moths in the apple districts, is a distinct advance in raising the standard of the fruit and without an increase in the arsenical residue on the fruit. The present expansion and permanency in the consumption of oil sprays is directly associated with the establishment of exact laboratory specifications for insecticidal values and plant tolerance. It seems reasonable to believe, then, that the use of oils on plants will be made to serve horticulturists' needs even more widely, and consumption be still further expanded, as our knowledge of the subject increases.

"Little is known of volatility, penetration and oxidation rates and their relation to this subject. Laboratory standards for these subjects and many further data on the physiological reactions of oils on plants are needed. The blending of oils to attain desired specifications is a subject about which almost nothing is known. It is usually considered desirable to blend only oils rather closely related as to viscosity and volatility, but where the boundaries may be is only conjecture, and the direction in which safety or danger lies is unknown."

Alliance of French Superphosphate Producers

IT has been reported in French trade circles that the Kuhlmann Co. has subscribed to the entire new stock issue of 20,000,000 francs of "La Bordelaise de Produits Chimiques." In addition the interests of the two companies will be mutually furthered by an interchange in the directorate. "La Bordelaise" is one of the principal French producers of sulphuric acid and superphosphates. Its superphosphate capacity is 280,000 metric tons, and that of Kuhlmann 400,000 tons. Saint Gobain, the leading producer, has a capacity of 960,000 tons.—U.S.A. Trade Commissioner, Paris.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgment

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

METAL ORE AND CHEMICAL CO., LTD., 5, Water Lane, E.C. (C.C., 13/9/30.) £69 18s. 5d. May 2.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

GREASLEY (GEORGE R.) AND CO., LTD., patent medicine manufacturers. (M., 13/9/30.) Registered September 2, £400 debenture, to G. N. Beaumont, St. Ives, Northenden Road, Gatley, cloth agent; general charge.

HAMPTON CHEMICAL CO., LTD., London, E.C. (M., 13/9/30.) Registered August 27, series of £500 debentures, present issue £250; general charge.

New Companies Registered

AROBAL MANUFACTURING CO.—Particulars were filed on September 3, pursuant to Section 344 of the Companies Act, 1929. The capital stock is 50,000 dollars in 100 dollar shares The company was incorporated in the State of New York in April, 1888, to manufacture and sell adhesive and glutinous articles and substances. In October, 1920, power was taken to manufacture and deal in pastes, gums and glues, whether made from vegetable, animal, mineral, chemical or other substances, starches, dextrines, malt, soap, colours, chemicals, dyes, cement compounds, varnishes, paints and pigments, etc. The British address is at 52, Farringdon Street, London, E.C.4. Directors: L. M. Weingartner, Tuckahol, New York; H. Kohler, Brooklyn; G. Weingartner, Tompkinsville, Staten Island, N.J.; A. F. Wright, Pelham, N.J., and Ida C. Seitz, Stapleton, Staten Island, N.J.

Production of Iodine in Ireland

New Government Factory

UNDER the scheme recently put into operation by the Irish Free State Department of Fisheries a factory for the production of iodine from kelp will shortly be opened at Galway. The majority of the inhabitants of the Western seaboard of Ireland are poor, and mostly make their living by collecting kelp for various commercial manufacturers of iodine who have been in the habit of paying about £2 per ton to the gatherers. Under the Government scheme prices ranging from £6 to £12 are paid by the department's agents according to the quality of the weed collected. There is now a stock of about 2,000 tons of kelp at the Galway factory, and the chief chemist reports that the iodine content of the weed is very good. The erection of the machinery will be completed in a few days, and it is hoped to start production early in October.

The same department is also encouraging the collection of Carrigeen Moss by paying prices approximately 50 per cent. greater than those offered by commercial firms. A curing factory is to be established in Connemara, where the moss will be cured on the American system; it will then be marketed for the usual industrial purposes; *i.e.*, manufacture of gelatine, clarifying of beers, etc., besides being retailed in small packages for household purposes.